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CLINICAL MEDICINE

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THE GASTROINTESTINAL TRACT AND STOOL FOLLOWING AUREOMYCIN THERAPY — *Royal L. Brown*

PSYCHOPATHOLOGY FOR THE GENERAL PRACTITIONER

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In order to facilitate the use of the abstracts in GENERAL PRACTICE CLINICS by our readers, we will start numbering in this issue. As there were 47 abstracts in the January magazine, the first in this issue will be number 48.

The complete cumulative cross reference index of the twelve 1951 issues of the INTERNATIONAL RECORD OF MEDICINE is scheduled to appear in the March 1952 number of this magazine.

The March issue will also have a new pale green cover, especially designed for this magazine. In keeping with the tradition of the INTERNATIONAL RECORD OF MEDICINE since its foundation in 1837 as the AMERICAN MEDICAL INTELLIGENCER, the original seal will appear with the seal of the Washington Institute of Medicine symbolizing more than a century of service devoted to the advancement of medical science.

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RECORD OF MEDICINE

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What Is Mongolism? (Congenital Acromicria)*

PATHOGENESIS AND EXPERIMENTAL TREATMENT

Clemens E. Benda, M.D.†

WAVERLEY, MASS.

Although mongolism has been known for eighty-five years and many outstanding scientists have contributed to its knowledge, mongolism is still but little understood. Among the many problems involved in the study of this condition, two are outstanding: first, the question as to what causes mongolism; and second, what is the essential physiopathology of that disorder which is usually designated with the strange term "mongolism." It seems to me that the first problem cannot be satisfactorily solved if the second question remains unanswered. It is with the second problem, therefore, that the present investigation is concerned.

Mongolism is associated with a number of developmental deficiencies, but the fundamental anomaly which produces the peculiar appearance that led to the term "mongolism" is an anomaly of the skull which differs in many aspects from the normal. Although some attention has been given to this fact by Van der Scheer[1] and especially by David M. Greig[2] who contributed an excellent anatomical analysis of three mongoloid skulls in 1927, all previous studies have dealt with mongolism at a more advanced age, and there is no available satisfactory analysis of the pathologic features in which the newborn mongoloid differs from a normal infant. If mongolism were a prenatal "monstrosity" or malformation similar to malformations of the type of cleft formations, oxycephaly or microcephaly, there should be little difficulty in making the diagnosis at birth, but in reality only a small percentage of cases is recognized at the time of birth, and the diagnosis

*Paper given in part on October 13, 1951, within the series of lectures sponsored by the North Carolina Academy of General Practice and Duke University School of Medicine and partially first presented at the Second International Congress of the American Association on Mental Deficiency, New York City, May 25, 1951.

†Director of Research & Clinical Psychiatry, W. E. Fernald State, Waverley, Mass.; Instructor in Neuropathology, Harvard Medical School, Boston.

in the majority is either missed or remains so dubious that it takes several weeks to months until the final diagnosis is established.

An analysis of the particular skull formation of the mongoloid infant, first found in several autopsies of newborn mongoloids and small infants, and later enlarged through a series of radiologic studies, convinced this writer that the formation of the skull basis and facial bones constitutes the essential pathology regardless of the degree and variations in which mongolism occurs. This anomaly is a growth deficiency of certain areas of the facial skull which remain underdeveloped. Since in acromegaly the same areas undergo the most striking enlargement, it is only logical that the growth deficiency of mongolism should be called "congenital acromicria"[3,4] (the opposite of acromegaly), a suggestion made by Schüller[5] as early as 1907 and reiterated by William Clift[6] in 1922. The problem, however, could not be brought to a final solution without a comparative study of mongoloid skulls and material from embryos. The unexpected opportunity to study a premature mongoloid, dead-born, the youngest specimen ever observed, provided the last missing link in this comparative anatomical study. On the other hand, it was necessary to study several embryos of an age group between 2½ and 5 months, a period which is usually not described in detail in any textbook of embryology. R. Virchow,[7] who introduced the study of the skull basis in his investigation on the skull of cretins, came to several apparently wrong conclusions due to the absence of proper material.

Nature as an architect follows two lines of development in completing the human skull: the formation of the "cerebral" skull or the envelope of the central nervous system, and the formation of the "visceral" skull. The former provides support and protection for the central nervous system, and the latter a strong apparatus as receiving and screening station composed of the oral and nasal cavities and their supporting structures. The development of the cerebral skull during the second to fifth month of gestation consists primarily of the formation of the so-called *basilaris cranii*, a composite of numerous bones which serve the brain as a supportive floor and form the axis of the whole skull. Since the brain does not yet need the outer armor and has still to pass through the birth channel, which calls for mobility of the protecting surface, the ossification of the membranous envelope lags far behind the stabilization of the cartilaginous foundation. However, since each animal (including man) needs, from the day of birth on, a strong oral system for providing the organism with food for its maintenance, Nature takes great pains in developing and stabilizing the masticatory-rhinal systems early enough to withstand the outside stress as soon as it arises. Both lines of development (of the cerebral and visceral skull) follow for a time a rather independent course, but the two systems are hinged upon the sphenoid body as the central supporting structure in which the visceral and cerebral skulls are joined together. The sphenoid body is composed of not less than fourteen different ossification centers; through an elaborate schedule in the timetable of ossification and stabilization of the various joints, the normal skull achieves the alignment of the final specific human face. It is not surprising that any delay in this timetable, even as short as a few days to weeks, may upset and disturb the whole inner relationship of visceral and cranial skull.

A study of an embryo whose age had been determined at 16 weeks shows two characteristics (figure 1-A). The visceral skull bones reveal a fairly well developed hard

palate which is well in the process of ossification. It measures about 2½ cm. in length and the anterior ridge is well in front of the tongue, which lies back of it. The many bones which form the ethmoid body are well united with the hard palate, though still mainly cartilaginous. The cerebral skull shows a well developed clivus in the process of ossification, which measures about 1½ cm. in length. The sphenoid body shows already the characteristic angulation with the clivus, although the main body and its junctions are still mainly cartilaginous.

In an embryo, the age of which had been determined as about 4½ months (figure 1-B), the visceral skull has greatly progressed in growth, ossification, and stabilization. The hard palate is much longer and flatter than a month before, and the teeth are recognizable within the alveolar ridge. The maxilla bones are also advanced in ossification and form a rather firm structure. The cerebral skull shows a great increase in the length of the clivus and the development of the sphenoid body, which now shows a distinct ossification center which is in the process of calcification. The anterior cavity has the characteristic horizontal outline of the later human skull.

In a mongoloid stillborn* (figure 1-D) whose age must be estimated as about 8 months, the visceral skull is markedly underdeveloped. The hard palate is short, measuring only about 2 cm., which is less than the size found in the embryo of 16 weeks. However, the palate is rather thick. The whole maxilla body appears greatly underdeveloped. As far as the cerebral skull basis is concerned, the clivus is very short, measuring only 21 millimeters, equaling the length of the embryo of 4½ months. The body of the sphenoid bone is tilted backwards and the basis continues in the direction of the clivus. The anterior skull cavity measures less than 2 cm., which is less than the length in the 4½ month embryo seen in figure 1-B. On the other hand, the cranial cavity appears balloon-shaped, due to the fact that the brain protrudes in a vertical and bitemporal direction because of the shortness of the skull basis. The incomplete stabilization of the various bone joints permits the cartilaginous cerebral skull and the visceral skull bones to assume a different relationship to that found in the better ossified, normal skull (figure 2-A). This specimen provides circumstantial evidence that, during a certain phase of development, the *basilaris cranii* failed to grow adequately, and the formation of the mouth and nasion lagged far behind the growth rate seen in normal embryos during the third and fourth month. Due to lag in growth, delayed ossification, and insufficient outlay, the whole oral-nasal cavity is underdeveloped and the anterior cavity of the skull too short. The brain, the mass of which corresponds at that age with the normal, forces the skull to bulge in a vertical and bitemporal direction. In general, the bone development is behind the development of the skin, which is thick and loose and encloses the skull and face as though it were intended for a much larger scaffolding.

In a specimen of a mongoloid child who died five months after birth, the clivus from its lower end to the tip of the posterior clinoid measured 24 millimeters, the anterior cavity from the anterior clinoid to the frontal bone 30 millimeters. It was conspicuous that the sphenoid body again formed an almost straight line with the clivus, and the

*Photographs and more details will be found in the author's article, "Congenital Acromicria" in "Biology of Mental Health and Disease," Symposium of the Milbank Foundation, November 1950, published by Paul B. Hoeber, New York, 1952.

anterior cavity of the skull continued the upward grade. The anterior cavity from the anterior edge of the sphenoid body to the frontal bone measured only 17 millimeters. The hard palate from the anterior ridge to its caudal end measured 26 millimeters, and the plane of the palate was at the level of the foramen magnum due to the underdevelopment of the visceral skull.

Thus, an analysis of the skull anomalies found in newborn mongoloids indicates that bone growth has suffered a temporary interruption, resulting in an underdevelopment and shortening of the facial bones. This underdevelopment manifests itself permanently in an abnormal shape of the mouth in which the palatal processes are short and arched, which is a very typical feature, but which has not been described sufficiently in previous publications. It also results in the abnormal egg shape of the orbit holes, with their lateral slanting, which manifests itself in the slanting palpebral fissures.

FIGURE 1.

1-A. Embryo* (47674). Calculated age, 16 weeks.
C: Clivus.
E: Ethmoid.
P: Hard Palate.
Pi: Pituitary.
S: Sphenoid Body.
T: Tongue.
Note clivus and sphenoid body with partial ossification; anterior sphenoid and ethmoid with crista cartilaginous; hard palate is firm and partially ossified; tongue within mouth behind maxillary ridge.

1-B. Embryo* (47706). Calculated age, 19 weeks.
Lettering, same as in "A."
Note progress in ossification and increase in size of sphenoid and ethmoid bones.

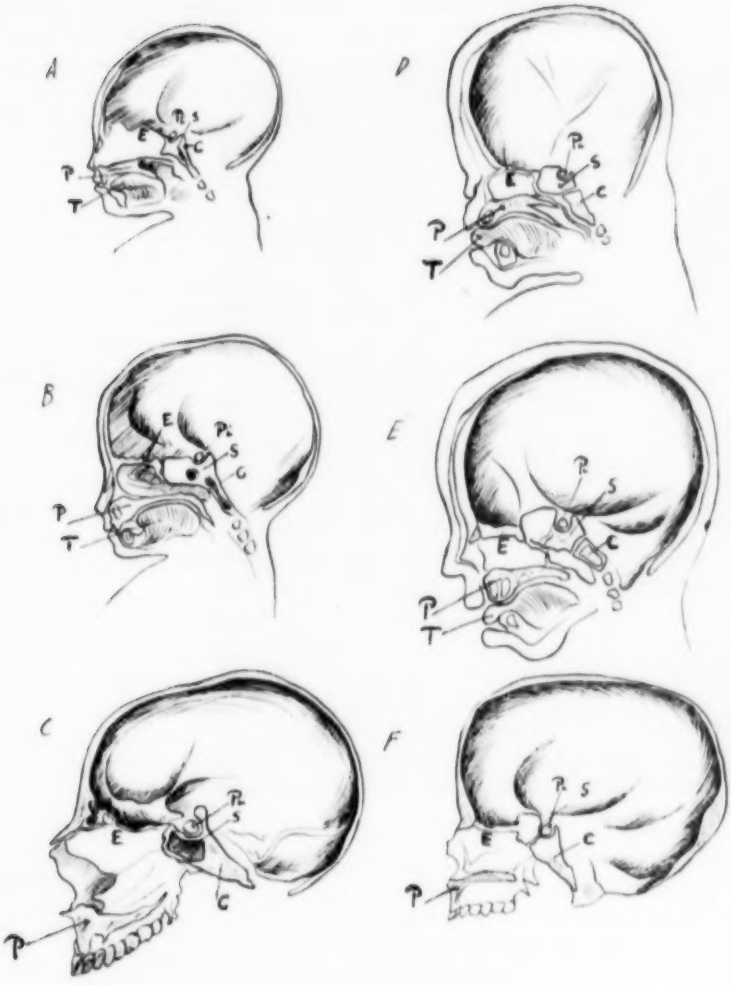
1-C. Diagram of Normal Adult Skull.
Lettering, same as in "A."
Note development of sphenoid and frontal sinuses, great increase in development of visceral skull.

1-D. Mongoloid Premature Stillborn.
Lettering, same as in "A."
Note smallness of clivus and sphenoid body, shortness of anterior cavity, upright grading; shortness of visceral skull; short, thick hard palate; tongue too big, protrudes between jaws. (For actual measurements, see text.)

1-E. Five Months Mongoloid Baby.
Lettering, same as in "A."
Note shortness of clivus; abnormal position of sphenoid; shortness of anterior skull cavity; shortness of hard palate, with tongue protruding.

1-F. Mongoloid Skull of Patient About Twenty Years of Age (Compare with "C").
Lettering, same as in "A."
Note shortness of clivus, abnormal position of sphenoid, remnants of cartilage in sphenoid, shortness of anterior cavity, smallness of maxilla and shortness of hard palate. The configuration of the skull is essentially the same as in the newborn, and the visceral skull has not participated in the extensive postnatal visceral development seen in the normal.

*By courtesy of Dr. Arthur T. Hertig, Lying-In Hospital, Boston, Mass.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A problem of primary importance is the question whether this acromicria of the mongoloid skull represents a primary dysostosis restricted to the osseous system, or whether all systems which develop at the same time suffer from a similar depression of growth activity. As far as the extremities and the trunk are concerned, it is well established that the whole osseous system suffers from a growth deficiency[8] which results usually in an underdeveloped or abnormal, curved little finger, a shortened thumb, and a general acromicria of the hands and feet. It also results in underdevelopment of the trunk. There is, however, a long list of developmental anomalies usually associated with the mongoloid growth deficiency. The synchronism of developmental failures during a specific period results in anomalies of the pigmentation of the iris, often in anomalies of the lens. In males, the testicles often fail to descend, and sometimes penis and scrotum are conspicuously underdeveloped.

An extensive study of the target glands of the pituitary, the thyroid,[9] adrenals and gonads,[4] shows that the structures which depend in their function on the tropic hormones excreted by the pituitary fail to grow in postnatal life, in spite of the fact that the original anlage of the target glands in general appears normal. The thyroid shows two types of anomalies: retardation in colloid formation and differentiation in the first few months after birth and, later, a tendency to a hypoplastic resting colloid thyroid. This thyroid shows large follicles filled with brittle colloid, and compression of the epithelial walls. The vascularization of the thyroid is scarce. The adrenals[4] show a failure of the outer layers to grow; there is a definite tendency to nodule formation in the outer layers and to an accumulation of eosinophilic islands in the medulla. The male gonads show lack of development of the spermato-genetic apparatus, with increasing fibrosis of the interstitial tissue. In the great majority of cases, no normal sperm cells are found in adults. In the ovaries, the ovular activity is poor and the involution of mature corpora lutea is abnormal. This often results in a cystic hypoplastic ovary in the adult mongoloid.

These data seem to indicate that insufficient tropic hormones are secreted by the pituitary. There is not yet agreement between anatomists and physiologists as to which pituitary cells are responsible for the production of the many hormonal effects which the pituitary anterior lobe is credited to produce. It is generally assumed that the eosinophilic cells are producing growth hormones, but this theory is solely based upon the fact that in acromegaly the tumor responsible for acromegalic growth is usually of an eosinophilic nature. However, if eosinophilic cells were responsible for the rapid growth of infants and young children, one would expect that the pituitary of a child contains a higher amount of eosinophilic cells than present after puberty, when growth has ceased. The opposite is true. The pituitary of a child contains a relatively small percentage of eosinophilic cells, while after puberty the eosinophilic cells constitute the largest percentage of cells present. This seems to suggest that the eosinophilic cells are more concerned with gonadotropic activity than with growth in particular. This is further suggested by the fact that the pituitary of a child contains mainly so-called "chromophobic" glandular cells, which have been previously considered as precursors of chromophilic cells but which this author credits with definite hormonal activity.[4] A comparative study between the pituitary of normal children and mongoloids[10] revealed that the latter contains a larger amount of eosinophilic cells than the normal child. Sometimes the whole pituitary was

found tightly filled with an eosinophilic cell, and only in a small percentage of cases was there a severe degeneration of all chromophilic cells, which suggests that the ability to form chromophilic granules was lost. The interpretation of these observations appears difficult, but observations on other conditions suggest that the accumulation of chromophilic cells (eosinophils or basophils) is due to a stagnation of excretory activity and not to overactivity itself. The findings in mongolism suggest, therefore, that either the target glands of the pituitary are unable to respond adequately to the available tropic hormones,

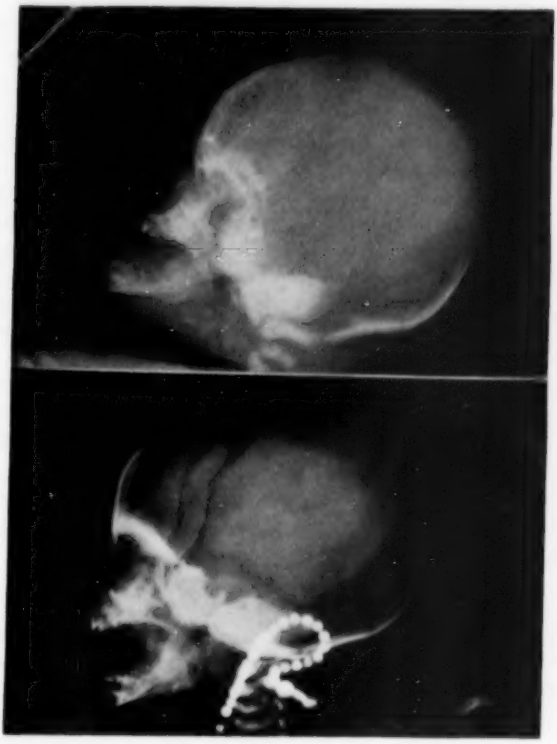


FIGURE 2.
2-A. X-ray, Lateral View of Mongoloid Premature Deadborn (figure 1-D).
Note extreme dorso-flexion of sphenoid, shortness of anterior cavity, retraction of nose bridge, and smallness of maxilla.
2-B. X-ray of Newborn Mongoloid.
Note immaturity of skull with gaping sutures, retro-flexion of sphenoid, shortness of anterior cavity and maxilla.

or the neurogenic stimulation of the pituitary is at fault. There is evidence that both factors are at play, because the degenerated hypoplastic gonads and the stagnant thyroid seem to have lost their responsiveness while the severe immaturity of the brain does not provide sufficient neurogenic stimulation to the pituitary gland.

As far as the nervous system of the mongoloid is concerned, the histologic study of more than 50 postmortem examinations[11] indicates two fundamental facts:

1. The central nervous system of the mongoloid fails to mature and differentiate during the prenatal period. We have to assume, therefore, that the same factors which have interfered with the development of bone growth and activity of the glandular

system have suppressed growth and differentiation of the central nervous system. This phenomenon accounts for the severe mental deficiency usually found associated with mongolism.

2. The disproportion between the cranial cavity and the brain leads to some disconfiguration of the form of the brain, and to the arresting of its differentiation. This second factor makes itself felt more and more, the older the mongoloid child becomes. Therefore, specimens from older patients show compression of convolutions, suppression of secondary fissuration, narrowing of the ventricles with fusion of the ventricle walls, severe gliosis and demyelination of the white matter, general lack of vascularity, and stagnation of blood flow.

THERAPEUTIC EXPERIMENTS

The histologic studies reported above have been enhanced by x-ray studies and clinical observations collected on over 500 patients during the last 15 years. X-rays of newborn mongoloids, as for instance seen in figure 2-A-B and figure 3-A, prove beyond doubt the anatomic disfiguration of the skull described above and demonstrated diagrammatically in figure 1-D, E, F. If the hypothesis is correct, that the mongoloid fetus suffered from a temporary suppression of growth and development in the neofetal period, the objective of any therapy should be to find means to compensate for the fetal growth deficiency at the earliest possible time and that means immediately after birth. Although it must be realized that the correction of prenatal growth deficiencies in postnatal life meets with great obstacles, the chances for successful correction are the better, the earlier treatment is instigated. The treatment should attack the basic disorder, since comparative x-ray studies on mongoloid children and adults show that the essential disproportion of the skull remains unaltered throughout life if the mongoloid is not treated.

Since the difference between mongolism and cretinism has been established in the beginning of this century, and cretinism is recognized as a primary thyroid deficiency, no systematic treatment of mongolism has been attempted. A few experiments have been made in a somewhat haphazard manner and all have been carried out on older children and adults. Moreover, no treatment carried out over several years in a systematic manner, and compared with a large control material, is known to the present writer. It has been shown by Freud, Levie, and Kroon[12] in animal experiments that after pituitary-ectomy the cartilage bone border is capable of reaction only for a very limited time. After the lapse of a few weeks, the cartilage cells undergo an irreversible degeneration, and even effective growth hormones are not able to produce any response. It has been demonstrated by the present writer[8] that in mongolism the cartilage bone border becomes abnormal, with a degeneration of the cartilage matrix, and with heavily calcified bone ridges separating the bone tissue from the degenerated cartilage. These tissues are not likely to react later to any treatment. One has, therefore, to postulate that any treatment of mongolism has to be initiated as early after birth as possible and carried out over several years of infancy and childhood, until a normal growth rate and a satisfactory development of the child is achieved. There is nothing unusual in postulating that a supportive treatment be carried out over many years, if one considers the necessity of a continual treatment of cretinism and other disorders of growth and hormonal deficiencies.

As to the type of treatment, it has been shown[4,9] that the thyroid is definitely abnormal in mongolism, although the anomaly is different from cretinism. In cretinism we deal with a primary inability of the thyroid to form colloid, either because the thyroid is aplastic or dysplastic. In mongolism we deal with a thyroid capable of forming colloid, but unable to provide the organism with sufficient thyroid hormones. The application of

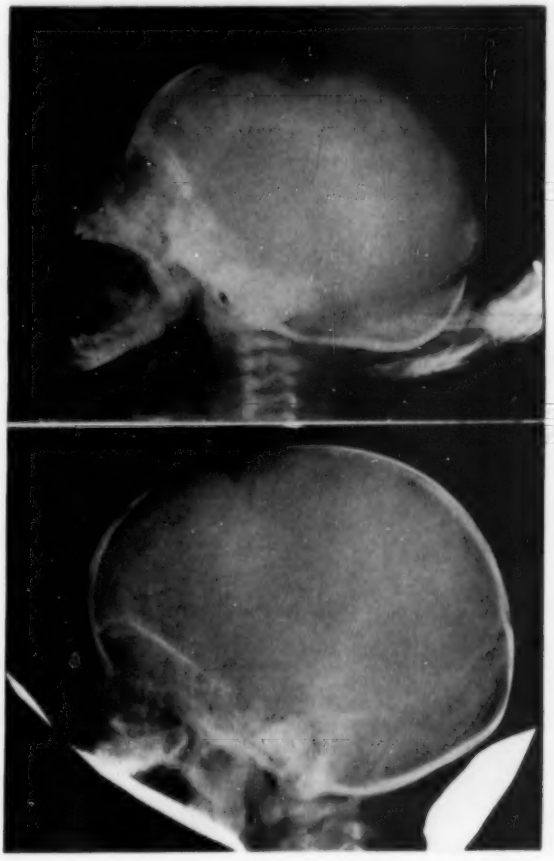


FIGURE 3.
3-A. Mongoloid 13 Days After Birth.
Note retro-flexion of sphenoid, shortness of anterior cavity and underdevelopment of maxilla; sutures, gaping, fontanel unusually large.

3-B. Same Patient. Age, 10 Months, After 9½ Months Treatment.
Note the remarkable increase in size of the skull, and the change in configuration of sphenoid body, anterior cavity, and maxilla. X-ray appearance of skull (normal).

thyroid therapy is indicated because of the influence of thyroid therapy on the general metabolism of the tissues and the underdeveloped vascular system. The effect of the thyroid hormones has been clearly restated in a recent publication, "Growth and Development," by Shelton and Skeels,[13] who write:

> "While the hypophyseal growth factor is primarily concerned with simple growth, the internal secretion of the thyroid gland affects mainly the processes of embryonal unfolding and development. Without the synergistic or catalytic effect of thyroid sub-

stance, the anabolic effects of the pituitary and gonadal secretions are insufficient to produce a normally grown, mature individual, and the potentialities for normal development lie dormant within the organism. *It is probable that the thyroid hormone does not produce growth by itself, but when it is administered in physiologic doses to a thyroid-deficient organism, there is a rapid release of 'stored up' growth potential."**

In mongolism, the demand for thyroid is not as great as in cretinism. In general, 3/10 grain after birth is sufficient. This dosage should be gradually increased to 1 grain at one year, and further increased according to the needs of the child. Not more than 1½ grains are necessary, though a few mongoloids need thyroid in dosages of from 2 to 3 grains daily. The thyroid therapy has to be strictly controlled by periodic serum-cholesterol

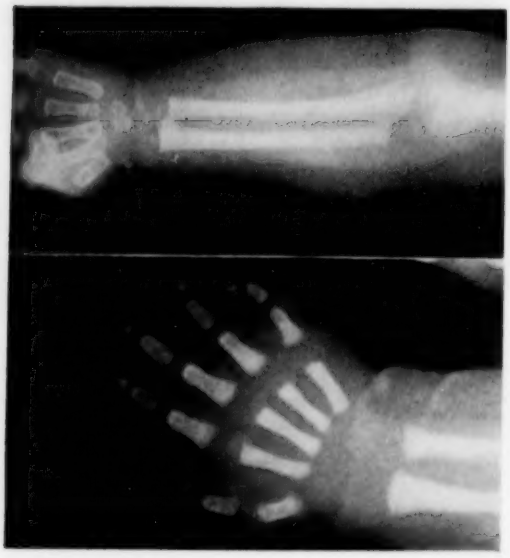


FIGURE 4.
4-A. Same Patient as Figure 3. Hands at 13 Days.
Note bones small, but fairly normal. Note thickness of skin.

4-B. Same Patient. Age, 10 Months.
There are two ossification centers besides well developed capitate and hamate. Ossification center of epiphysis of radius also present. Bone age advanced over chronological age.

determinations and x-ray studies of the bones, in order to ascertain whether the appearance of bone centers is normal, or too exaggerated through thyroid therapy which is too drastic. The heart rate and the general behavior of the child should also be closely observed. The overactivity frequently seen in mongolism has nothing to do with thyroid therapy because it occurs independently. Sometimes a hyperactive mongoloid will become less active with therapy. On the other hand, hyperactivity may be further increased through therapy, and in those instances the lowest possible dosage is advisable.

While thyroid therapy is indicated as a synergistic and catalytic factor to "release growth potentialities" (Shelton and Skeels) and prevent the degeneration of the bone cartilage, it is obvious that thyroid therapy in mongolism is not sufficient to produce satisfactory results. In order to overcome the congenital acromicria and produce sufficient growth of the mongoloid infant, who falls increasingly behind the normal growth rate

*Italics by the present writer.

as time goes on, a growth factor has to be introduced. It is generally assumed that growth in infancy and childhood is stimulated by pituitary factors, while the second phase of growth in the early teens seems to be at least partially advanced by the gonadal hormones which are poured into the system as puberty approaches. Although the mongoloid (especially the male) shows gonadal hypoplasia in the majority of cases, it is not likely that the gonadal insufficiency is responsible for the growth deficiency seen in mongolism in early life. We have to assume that at that time the pituitary hormones are at fault, and it seems reasonable to attempt to overcome the growth deficiency by application of pituitary hormones.

The application of growth hormones from the pituitary is still a matter of much argument. It is possible, by injection of a crude extract, to stimulate growth in the human, but it is generally assumed that the oral application of pituitary hormones is ineffective. As Shelton and Skeels state:

> "At the present state of development, there is no pituitary extract with proved human somatotrophic activity available for clinical use."

It is this writer's opinion that the lack of adequate growth hormones for clinical use in most of the available commercial preparations is partially due to the fact that the collection of pituitary material is made from adult animals in the great slaughterhouses, where an abundance of animal pituitaries is available. These animals, however, are overfed for the purpose of meat production, and it appears illogical to assume that the pituitary of an overfed, fat adult animal contains any growth factors. The adult pituitary produces only minimal doses of growth hormones, and adrenotropic and thyrotropic hormones are available in an amount for maintenance purposes, while the majority of pituitary cells serve gonadal activity and are concerned with the production of follicle and corpus luteum stimulating hormones in the female and similar factors in the male. If one expects to collect a larger amount of crude somatotropic factors, this should be collected from immature animals.

Due to the cooperation of the Medical Research Department of the Armour Company of Chicago, Illinois, this company has prepared a calf pituitary powder from calves and supplied the material for experimental purposes during the last five years. Although this factor has not yet been sufficiently analyzed biochemically, and experiments on pituitary-ectomized animals are still in the very beginning, the clinical use of this crude hormone has shown that it has a definite growth-stimulating and gonadotropic action in infants and children. The latter factor was seen by the appearance of pubic hair in some of the treated cases at an age before 10, and the beginning of menstruation in a few mongoloid girls between 8 and 11, while the average mongoloid girl does not menstruate before late in her teens. The effect of the somatotropic factor of calf pituitary on growth could be demonstrated in a comparative study of the growth rate in mongoloids compared with the ample control material available in institutions and outpatient clinics.

The main interest has been centered on whether it is possible to influence the acromicric configuration of the skull, which is seen in the newborn mongoloid and remains a characteristic feature throughout life. Out of a much larger material, the following 2 cases shall demonstrate the problem at hand.

Case 1. This patient was seen on the thirteenth day after birth. The male child measured 19½ inches in length. The head showed a length of 11 cm., bitemporal width of 9.7 cm., and a cir-

cumference of 13.1 inches. The fontanel was unusually large, and the sagittal suiture as well as the frontal suture wide open. The eyes were usually kept closed and were small. There were marginal skin folds on both internal angles. The nose was small. There was an umbilical hernia. The hands appeared fairly normal, but the feet showed a deep gap between the big toe and the second toe. The skin was thin and marmorated. The diagnosis of mongolism, which had been previously suspected, was definitely confirmed. The child was put on 1 pituitary capsule of the new whole pituitary powder daily. He also received 3/10 grain thyroid daily. X-rays of the skull at 13 days showed the typical disfiguration of the skull, as seen in figure 2-B. The hands showed no metacarpal bone centers as is normal for this age.

An examination of the child at an age of 10 months showed that the head had greatly advanced in size. It now measured 17½ inches in circumference, with a length of 14.9 cm. and a width of 12.2 cm. The body had grown 10¼ inches, measuring now 29¾ inches. The child was a very fair, blond boy with a long, dolichocephalic, somewhat narrow head. There were marked epicanthal marginal folds. The eyes showed occasional nystagmus. The mouth was fairly small, and no teeth had erupted. The complexion of the child was pale, but the skin was thin and elastic, with little puffiness. The body was well formed, the belly little protruding. The penis was small and the testicles not descended. The extremities were well formed, and the hands and feet of normal size. X-rays of the hands showed that not only were the first two metacarpal bone centers (capitate and hamate) present and well developed, but the epiphysis of the radius was in the process of developing and two more metacarpal centers were in appearance, which corresponds with the advanced appearance of the centers for a one and one-half-year level. Most striking was the change in the configuration of the skull. The lateral x-ray view showed a well formed skull with a well shaped sphenoid body and a well developed anterior cavity of the skull, which was only very slightly ascending and, in general, fairly horizontal. The nasion had developed. The visceral skull was still somewhat smaller than in the average, but not too strikingly so. It is, therefore, obvious from these x-rays that the pituitary-thyroid treatment which the child received from 14 days after birth on has greatly influenced the configuration of the skull, and a growth has been produced in those areas which usually remain underdeveloped in mongolism, as ample control material can demonstrate.

Case 2. This child, born in July 1942, was first seen at an age of 16 months and 2 weeks. His birth weight had been 4 pounds, 12 ounces. At the age of 16 months the child measured 28 inches in length; the head measured 15.3 cm. in length, 12.5 cm. in width, head circumference 45 cm. (18 inches). The child was treated with thyroid, which had to be increased sometimes to a dosage as high as 3 grains daily because, with smaller dosages, the child became listless and showed definite signs of hypothyroidism. In addition, he received fairly high doses of dicalcium phosphate and 1 pituitary capsule daily, which treatment was interrupted for a short time only by 5 milligrams of testosterone (oreton, Schering) which was later replaced again by the pituitary capsules. The child increased steadily in height, and gained in head circumference and measurements. The length of the skull, which in mongolism rarely exceeds 15.9 or 16 cm., increased to a present length of 17 cm. The width, which started with 12.5, increased to 13.5 cm. The boy at 8 years of age is fairly tall for his age and physically well developed, 48 inches in height, weighing 54 pounds. This height corresponds to the average range of 47.5-50.9 inches given as normal height for 8 years by Shelton and Skeels.

X-rays of the head, taken every year, showed the typical configuration of the mongoloid skull and, although the head enlarged in size, the response of the acromictic parts (the floor of the anterior cavity and the visceral skull) was extremely slow. It was not before the fifth year of treatment that a noticeable change in the skull configuration took place. Figure 5-C shows the skull in 1950, at the child's age of 8 years, and the change in the configuration of the skull compared with pictures at ages of 2 and 3 (figures 5-A, B) is quite conspicuous. Comparison of the first two pictures shows clearly the phenomenon seen always in mongolism in untreated cases, that the skull may gain in size, but the sphenoid body and the configuration of the skull remain identical throughout the years.

DISCUSSION

A comparative study of the normal fetal development of the cerebral and visceral skull and the same features in mongolism provides conclusive evidence that the mongoloid skull underlies a growth deficiency which changes the particular relationship and configuration of the human skull as seen normally at birth. The specific features of the normal head are determined by the coordination of the growth of the skull base and the visceral skull at a particular time. The anterior cavity in its horizontal plane and, accordingly, the specific shape of the frontal lobes of the brain are determined by the preceding ossification of the visceral skull and the attached skull basis which resists the thrust of the increasing brain mass to follow the physical trend toward a balloon shape of the brain cavity, as can be seen in certain malformations, if either the cartilaginous bones are defective in growth or the inside pressure of the brain is too strong. The study of the mongoloid skull shows a most striking difference in the lack of growth of those cartilaginous bones which ossify earliest and have to grow considerably between the prenatal third and fifth months in order to provide a sufficiently firm structure for the visceral skull and the supporting structures of the brain cavity. These observations seem to confirm Greig's statement: "Even from the skull alone there seems evidence that *development normally begun** has mapped out all structures and features in the embryo but has failed to lead them to perfection during foetal growth . . .".[2]

While in fetal life the formation of the visceral skull is achieved between the third and fifth months in a phase of intensive growth and then remains relatively unchanged, and most of the growth energy is spent on the enlargement and development of the cerebral skull, in the postnatal period after the end of the second year the relationship is reversed, and the adult skull differs from the infant skull mainly in the huge development of the visceral parts: nasal and oral cavities (figure 1-C). In postnatal life the mongoloid suffers permanently from the abnormal formation and correlation of the visceral skull, wrongly laid out in the early fetal period. As skulls of adolescent mongoloids show, without doubt, the positions of the sphenoid body and the anterior cavity remain abnormal and the hard palate remains abnormally short (figure 1-F). The nasal cavity fails to grow adequately. Therefore, later in life the palate of the mongoloid remains at a higher plane in relation to the *foramen magnum* and the skull basis than in the normal adult, while in the newborn mongoloid the shortness of the skull basis places the oral cavity lower than in the normal infant.

One of the main problems found in mongolism has been to determine whether the growth disorder of the skull is a local deficiency, possibly due to local or cerebral factors, or whether the "acromicria" involves the whole skeleton. As to the question whether the mongoloid growth disorder is primarily due to cerebral deficiency, it must be said that the study of anencephalic and microcephalic children provides conclusive evidence that anomalies of the brain do not prevent the visceral skull and the body from developing adequately. Even in anencephaly we find a normal formation of the facial structures, which often appear huge in comparison with the underdeveloped cerebral skull. These observations indicate that the anomalies found in the mongoloid child are not due to a primary failure of cerebral development. A study of selected areas of the skeleton in mongolism (spine, hand bones, toes, femur)[8] shows that the growth deficiency is general,

*Italics by this writer.

and the underlying defect is a disorder of central growth regulation and not a local phenomenon. The target glands of the pituitary (the thyroid, adrenals and gonads) were found in a resting condition and progressively hypoplastic, which can only be interpreted as lack of growth stimulation.[4] Studies of the pituitary have shown that the pituitary of the mongoloid is apparently inactive.

Experimental treatment with a new pituitary growth factor obtained from immature animals (calves), combined with thyroid treatment, shows that it is possible to influence the physical growth rate of the mongoloid child to such an extent that body growth proceeds within the normal range. X-ray studies of the hands show a very accelerated appearance of ossification centers, which usually are slow to appear in the mongoloid, although the first two metacarpal centers are usually present three to six months after birth. A comparative x-ray study of the skull configuration shows that the application of this pituitary growth factor has a definite influence on the skull and produces a change in the skull configuration which approaches the normal configuration.

Mental Development. Since mongolism is associated with mental deficiency, many physicians apparently feel that it is useless to attempt any treatment as long as the mental deficiency cannot be entirely corrected. As has been shown above, the mental deficiency of the mongoloid child is due to an extremely slow rate of maturation of the central nervous system, a varying degree of underdevelopment, and an increasing disproportion between the underdeveloped skull and the brain. As far as the last point is concerned, the treatment of mongolism promises a beneficial effect upon brain development since the more appropriate growth of the mongoloid skull seems to promise a more adequate development of the brain. As far as the deceleration of maturation is concerned, it is not yet clear whether pituitary and thyroid hormones have any influence upon brain maturation, especially myelination. The present data do not warrant any such assumption, and more research is needed to establish whether the rate of brain maturation can be influenced by any factor. As far as anomalies in differentiation of the mongoloid brain which occurred in prenatal life are concerned, there is little hope of overcoming this disorder.

The rationale for the treatment of mongolism is seen in the following points:

The strange appearance of the mongoloid child frequently prevents association with other children and makes the presence of a mongoloid child in a family a matter of discomfort and embarrassment for the other members of the family, especially the siblings. If the physical growth disorder of mongolism can be corrected, at least partially, the better developed and better looking child will be more acceptable to its surroundings and can join nursery groups or participate in play activities with other children on the street.

The faster physical development of the treated mongoloid makes the majority of these children able to sit up between 6 and 9 months, to stand up at around 12 months, and to walk at least at an age of 2 years. This acceleration of the acquisition of motor control and muscular strength is of advantage to the family, as it will not be necessary to carry the usually heavy infant around for years. How far the mental development of the mongoloid child can be improved, or an originally fairly high IQ level, can be at least maintained, is at present under investigation.

The acquisition of motor control is of importance to the child, who in this way becomes part of the family at an earlier date.

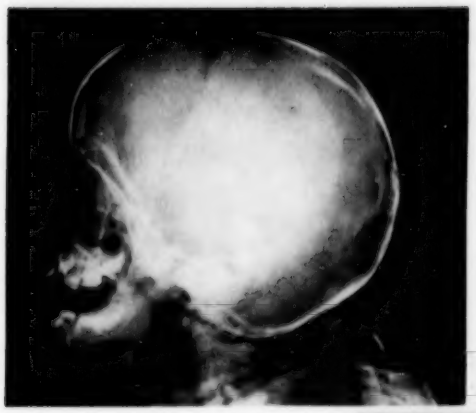
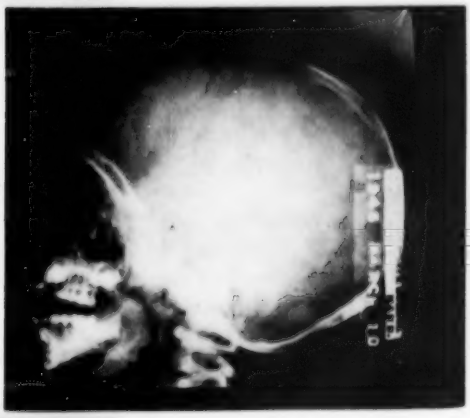


FIGURE 5.

5-A. Lateral View of Mongoloid. Age, 1 year 7 months (March 1944).

Fontanel still wide open. *Note* upright anterior skull cavity, and underdevelopment of maxilla.



5-B. Same Patient, one year later. Age: 2 years, 7 months.

Note considerable increase in size of maxilla and length of skull.

5-C. Same Patient, 5 years 7 months later.

Note further increase in skull size, with dolichocephalic development; pneumatization of skull usually lacking in mongolism well progressed. Note considerable enlargement of maxilla and sinus formation in sphenoid.

For the right selection of cases, a number of items should be taken into consideration: Mongolism occurs in a great variety of degrees, and ranges from idiocy to IQ levels in the low 70's. Physically, mongolism ranges between a combination of many severe malformations to a fairly adequate physical development with only slight deviations from the norm. The treatment of mongolism should be based on a thorough study of the individual child. It is quite obvious that severe malformations are not responsive to any treatment, and there is little use in treating children with very severe handicaps. This is generally accepted for the training of cerebral palsy children and should be equally applied to mongolism.

The well being of the infant, whether normal or mongoloid, depends upon emotional factors as much as on adequate nutrition and treatment. If the mongoloid child is rejected by its parents and siblings, it is impossible to overcome the handicaps associated with childhood rejection. The treatment of mongolism can only be successful, therefore, within a family group in which the child is loved and accepted. It is almost impossible to treat mongolism successfully in a large institution, although it may be a promising research project to compare the treated mongoloid infant with a group of untreated children of similar severity under well controlled hospital conditions.

SUMMARY AND CONCLUSIONS

1. A comparative study of the development of the human skull during the prenatal period and the development of the mongoloid skull provides evidence that the mongoloid visceral skull lags greatly in development during the third to fifth fetal month.
2. It is demonstrated that mongolism is a deceleration of fetal growth of the skull basis and the visceral skull, resulting in an underdevelopment of the *basilaris cranii* and the nasal and oral cavities. The anatomical and radiologic evidence points toward a congenital "acromicria."
3. The growth deficiency seen in mongolism is not limited to the cranium but involves the whole skeleton, pointing toward a defect in central growth regulation. This fact is further emphasized by the underdevelopment of the target glands of the pituitary (gonads, adrenals, thyroid) which often do not show congenital anatomic anomalies but remain hypoplastic.
4. The temporary suppression of development in the neofetal period which produces the characteristic features of mongolism (congenital acromicria) results in a deficiency of central growth regulation as a permanent feature of mongolism. The data point toward the fact that the target glands and tissues controlled by hypothalamic-pituitary growth regulation lose their responsiveness to growth factors. On the other hand, the immaturity of the brain results in a lack of neurogenic stimulation of the pituitary, with the result that the pituitary activity is inadequate.
5. A possible treatment of mongolism has to break this vicious circle at the earliest possible date after birth by stimulating the decelerated growth rate found in the mongoloid child. Previous therapeutic efforts to influence the mongoloid appearance have been unsuccessful on account of the fact that treatment has usually been started too late, that it has been carried over too short a time, and that inadequate therapeutic agents for influencing the growth deficiency have been used.

6. The present study reports on observations made with the application of a new pituitary hormone, collected from immature animals. The study has been carried out over about five years, on more than 50 patients, controlled by x-ray studies at regular intervals. Out of this material, observations on 2 patients are reported.

7. It is demonstrated by x-ray studies of a mongoloid infant who was seen 13 days after birth, and 9½ months later, that it is possible to stimulate the growth of the skull basis and visceral skull, and change the configuration of the mongoloid head. A second case is demonstrated, in which the treatment was started at 16 months. A much slower response to the treatment was observed but at an age of 9 years the child showed physically a fairly adequate development, and the skull configuration had finally changed.

8. As to the mental development, there is no evidence that the application of thyroid and pituitary directly influences the maturation of the brain. However, there are indications that the treatment which influences the growth of the head and the development of the vascular system, and has a definite influence on the general metabolism, produces a more favorable environment for the brain which accelerates acquisition of motor control and helps to maintain higher IQ ratings.

9. The experimental treatment of mongolism cannot influence severe congenital malformations, which are often associated with this condition. The treatment of mongolism should, therefore, only be attempted in those cases where the mongoloid newborn is relatively well developed. It should be generally realized that mongolism occurs in great variations and is by no means a uniform condition. The term "congenital acromicria" facilitates an understanding that any growth deficiency occurs with varying degrees of severity.

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Terramycin* In The Treatment Of Malaria

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In a recent clinical paper we reported the encouraging results obtained with terramycin in the treatment of 2 cases of malaria, one caused by *Plasmodium vivax* and the other by *Plasmodium falciparum*.* In order to verify the results of these preliminary observations, 15 new cases were treated. In this report we present our conclusions.

Most of the clinical studies were conducted in Sauta, a small hamlet of the Province of Nayarit on the Pacific coast of Mexico and the rest at the "Servicio de Infectologia" of the Civil Hospital of Guadalajara, Jal.

Sauta, a small settlement 40 miles southeast of the city of Tepic on the Pacific coast, has a population of six hundred. The climate is warm, with highest temperatures between May and September, and it rains frequently. The surroundings are extensive rice fields which constitute an excellent breeding place for anopheles mosquitoes. Housing is composed mainly of log cottages plastered with mud, without any protection against flies, and many of them even lack doors. Most of the people are mestizos who depend on farming, and their principal products are rice, Indian corn (maize), and beans.

There is a high yearly incidence of malaria. In 1949 Gigliole and Downs, of the Rockefeller Institute, found a spleen rate of 42.5 per cent and a corrected parasite rate of 14.7 per cent. Infestation by *P. vivax* is the most frequent, but *P. falciparum* is not uncommon, and the predominant types of anopheles mosquitoes are *A. pseudopunctipenis* and *A. maculipenis*. The rice fields provide extensive breeding places.

The incidence of malaria in Guadalajara is now rather low, after an extensive sanitation program undertaken by the Public Health Secretariat. The city is 4,950 feet above sea level; it has a population of about 400,000 and has a mild temperate climate without great seasonal temperature changes. The main breeding places are now located in small creeks and streams in the outskirts of the city. The most common form of malarial parasite is *P. vivax*, but *P. falciparum* is not rare, particularly in the northeast section. The two predominant types of mosquitoes are *A. quadrimaculatus and A. albimanus*.

CLINICAL MATERIAL

Among the 15 patients treated there were 11 men and 4 women. Their distribution by age and sex is shown in table I.

* Terramycin was sent to us through the courtesy of the late Dr. Ray A. Patelski of Chas. Pfizer & Co., Inc., Brooklyn, N. Y.

TABLE I

Age	Male	Female	Total
0 to 5	2	1	3
6 to 10	3	2	5
11 to 15	1	0	1
16 to 20	0	0	0
21 to 25	1	0	1
26 to 30	1	0	1
31 to 35	1	0	1
36 to 40	2	0	2
41 to 45	0	0	0
46 to 50	0	1	1

The youngest patient was 15 months old and the oldest 50 years. From the nutritional standpoint they were all in fairly good condition.

The clinical picture was typical of the moderately severe forms, without complications, found on the west coast of Mexico in cases of *P. vivax* or *P. falciparum* infestation. All patients underwent the classical cycle of chills, fever, and sweating.

FIGURE 1

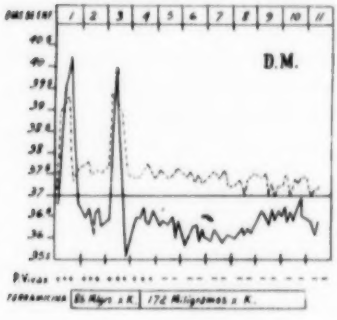
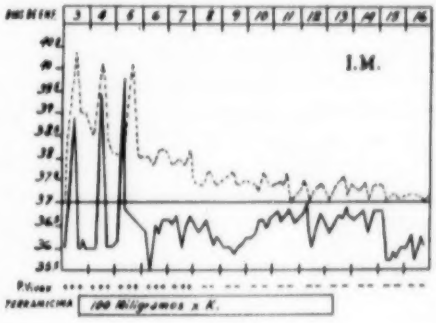


FIGURE 2



Dias de Enf. — Days of Sickness

Six cases, 4 of *P. vivax* and 2 of *P. falciparum* infestation, had daily febril paroxysms; 5 cases (*P. vivax*) had paroxysms every day; and probably due to early initiation of therapy, 2 patients had only one paroxysm. In the last 2 cases caused by *P. vivax* and *P. falciparum*, respectively, the fever had an irregular course.

In 94 per cent of the patients the spleen was enlarged. Splenomegalia was more or less moderate, except in 2 cases in which the organ was felt near the umbilical area.

Clinical diagnosis was confirmed by daily examination of periphereal blood smears (Giemsa and Wright stained). In the 12 cases with *P. vivax*, both sexual and asexual forms of the parasite were found at different stages of the disease. Only the young forms of the asexual cycle and gametes were found in the cases with *P. falciparum*.

FIGURE 3

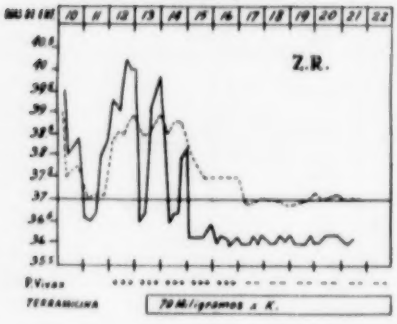
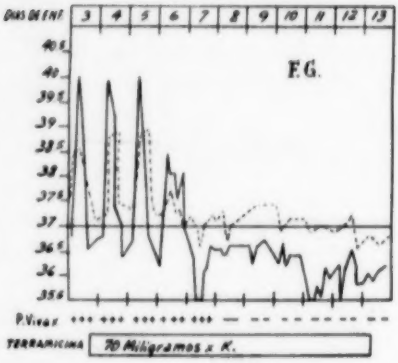


FIGURE 4



TREATMENT

Therapy was started in all but 4 cases (P.O., I.L., D.M. and V.S.3, after several paroxysms. In these 4 cases therapy was initiated on the day of the first fever episode or on the following day. In some patients therapy was started only after 13 to 16 days of illness. Terramycin was given orally in 250 mg. capsules, according to the weight of the patient. The highest dose was 222 mg. per Kg. body weight per day (case E.V.) and the smallest was 35 mg. per Kg. per day (Case I.L.). The dose administered to some patients seemed to be inadequate and it was increased. The total daily dose was divided in 4 equal doses and given at 6 hour intervals for a period of 4 to 10 days.

TABLE II

Name	Age	Sex	Plasmodium	Forms	Type of Paroxysm	Splenomegalia
C. G.	31	M	Vivax	A. and G.*	E. O. D.**	1st degree
Z. R.	18†	M	Vivax	A. and G.	irregular	1st degree
D. J.	23	M	Falciparum	A. and G.	irregular	1st degree
R. A.	13	M	Falciparum	A. and G.	daily	1st degree
F. R.	37	M	Vivax	A. and G.	E. O. D.	1st degree
P. O.	10	M	Vivax	A. and G.	only one	3d degree
D. M.	8	F	Vivax	A. and G.	E. O. D.	1st degree
C. I.	15†	F	Vivax	A. and G.	E. O. D.	1st degree
I. M.	2	M	Vivax	A. and G.	daily	1st degree
F. G.	8	M	Vivax	A. and G.	daily	1st degree
V. S.	10	M	Vivax	A. and G.	only one	1st degree
M. N.	50	F	Falciparum	A. and G.	daily	2nd degree
E. V.	6	F	Vivax	A. and G.	E. O. D.	1st degree
I. L.	27	M	Vivax	A. and G.	daily	Negative
M. H.	40	M	Vivax	A. and G.	daily	1st degree

* Asexual and gametes.
** Every other day.
† Months.

TABLE III

Name	Plasmodium	Day of Illness	Dosage Mg./Kg./Day	Duration of Treatment (Days)	Parox. After Therapy Starts	Disappearance of Parasite (Days)
C. G.	Vivax	4	50	9	2	4
Z. R.	Vivax	13	70	9	1	4
D. J.	Falciparum	16	70	10	2	no
R. A.	Falciparum		3/35 8/70	11	3	no
F. R.	Vivax	11	47	9	1	4
P. O.	Vivax	1	90	8	0	4
D. M.	Vivax	1	2/86 6/172	9	1	3
C. I.	Vivax	3	6/93 3/186	10	2	5
I. M.	Vivax	3	100	10	2	4
F. G.	Vivax	3	70	10	3	4
V. S.	Vivax	2	90	8	0	3
M. M.	Falciparum	5	3/78 7/117	10	3	no
E. V.	Vivax	3	2/111 7/222	9	1	5
I. L.	Vivax	2	35	6	1	2
M. H.	Vivax	2	50	9	5	10

RESULTS

Positive results were obtained in all cases, with disappearance of the symptoms and of the parasite from the peripheral blood, except in the cases with *P. falciparum* in which sexual forms of the parasite persisted throughout the follow-up.

Febrile paroxysms persisted for one to five days after therapy was started, and their number ranged from 0 to 5, with an average of 1.7. In 10 cases (62 per cent) the paroxysms disappeared suddenly (figures 1 and 2) and in the other 5 (31 per cent) subsided gradually (figures 3 and 4). Case P.O. was treated on the first day of clinical illness and terramycin was started during the paroxysm. This patient had no other febrile episodes during treatment nor during the follow-up (figure 5).

In case V.S., treatment was started on the second day of illness during the fall

FIGURE 5

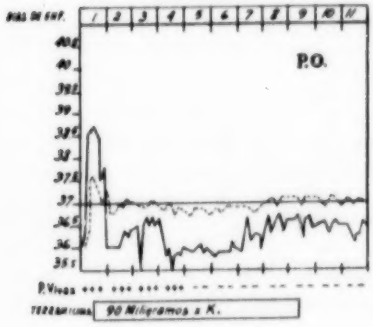


FIGURE 6

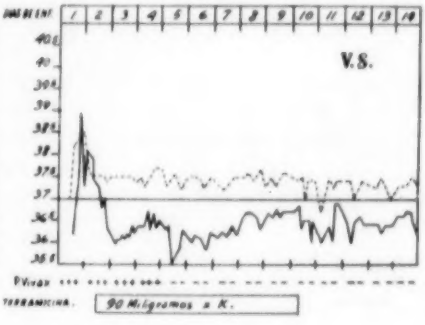
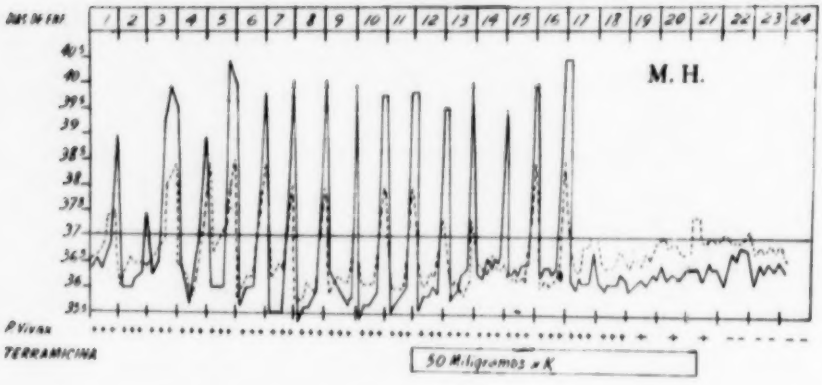


FIGURE 7



in temperature after the first paroxysm, and the patient had no other rise in temperature (figure 6). These were the cases in which the best results were obtained. The poorest response was that of case M.H. who had 5 febrile paroxysms after terramycin was started (figure 7).

In the cases of *P. vivax*, the parasite disappeared from the peripheral blood between the third and the ninth day of treatment, with an average of 6.7 days. As therapy progressed the total number of parasites in the blood decreased gradually.

In the cases of *P. falciparum*, only the young asexual forms disappeared, but the gametes persisted indefinitely. Apparently the drug had no action on them (figures 8 and 9).

With the fall in temperature and disappearance of paroxysms, the general condition of the patients improved rapidly, anemia decreased, and there was a general weight increase.

FIGURE 8

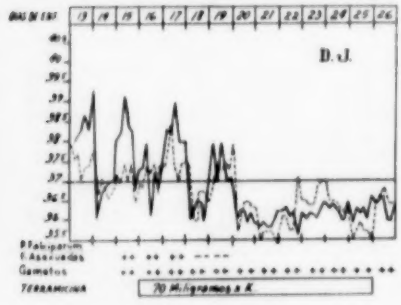
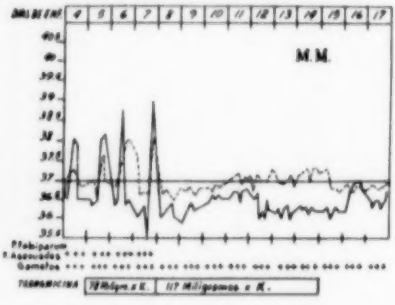


FIGURE 9



RELAPSES

No relapses have occurred during a follow-up of three months, but it is necessary to prolong this period of observation.

DISCUSSION

The uniform response obtained in this group of patients confirm the preliminary observations.[1] The disappearance of paroxysms and of the parasite from the blood in all probability are related to the administration of the drug. It is true that the spontaneous course of malaria varies greatly and that frequently the febrile stage is very short, but the fact that the disappearance of both the fever and the parasite from the blood took place in all cases during the first days after treatment was started; that this occurred promptly in 62 per cent of the patients in which the severity of the previous paroxysms and the number of parasites in the blood did not anticipate any improvement; that results were uniform even though therapy was started at different times after onset, with different types of clinical pictures and different forms of Plasmodia, strongly indicate that terramycin is effective in the treatment of human malaria.

It is interesting to note the progressive decrease in the number of parasites in the blood as treatment advanced. When the total number of parasites was so small as not to cause a febrile episode, these disappeared entirely. The parasite persisted in the blood for a few days and then disappeared (figure 10).

In the cases of *P. falciparum* the drug was only active on the asexual forms (that are responsible for the clinical picture). Gametes persisted throughout the period of observation. In this respect the action of terramycin is similar to what we have observed with aureomycin and chloramphenicol, as we recently reported.[2,3] In these studies we did not attempt to determine if the drug acts differently on the sexual and asexual forms of *P. vivax*. This shall be the subject of future research.

In respect to the relation between the start of therapy and the results obtained, we can only point out that 71 per cent of the cases who had no fever paroxysms after terramycin was started, or that had only one paroxysm, corresponded to patients who were treated one to three days after onset of the disease. On the other hand, case M.H., who was treated 12 days after onset, had the greatest number of paroxysms. We believe that early therapy favors the results obtained with the drug.

It has not been possible to draw any conclusions in respect to the dosage used and the results obtained, as these results varied greatly with the same dose. Similar results were observed using small and high doses. It is still necessary to investigate the optimal dose, as well as the smallest useful dose.

Large periods of observation are necessary to study the relapse rate. However this study is seriously hampered due to the permanent danger of reinfection.

Finally, we consider it of great interest to determine in future studies whether terramycin has any prophylactic value against malaria.

SUMMARY AND CONCLUSIONS

1. A report on the treatment of 15 patients of malaria with orally administered terramycin is presented.

2. Among the 15 patients treated, there were 11 men and 4 women. The age limits were 15 months and 50 years. The clinical picture was that characteristic of moderately severe forms.

3. Twelve cases were caused by *P. vivax* and the other 3 by *P. falciparum*.

4. The dosage schedule varied from 35 to 222 mg./Kg. per day, administered over a period of from 6 to 10 days.

5. A favorable response was observed in all cases. Paroxysms persisted from one to five days after terramycin was started. Their number varied from 0 to 5 paroxysms.

6. The parasite disappeared between the third and the ninth day of treatment in the cases caused by *P. vivax*. In those caused by *P. falciparum*, only the asexual forms disappeared, but gametes persisted.

7. As fever disappeared, there was a rapid improvement of all other symptoms; no relapses were observed during the follow-up.

8. New studies are necessary to determine the smallest useful dose and the prophylactic value of the drug.

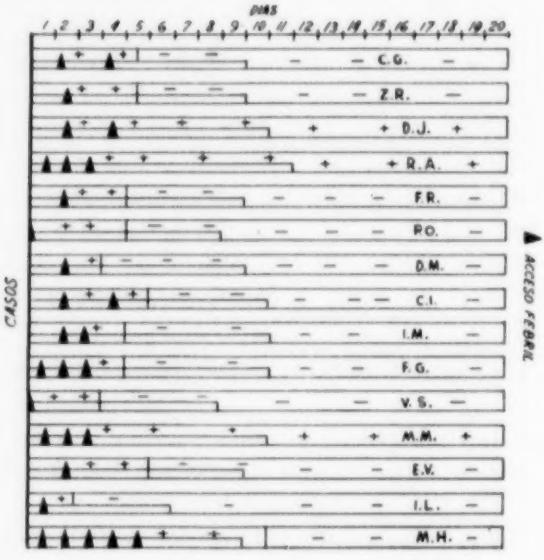


FIG. 10. Persistence of the Parasite in the Peripheral Blood Since the Start of Treatment.

Dias = Days
Casos = Cases
Acceso Febril = Fever Paroxysm

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A teaching doctor at Stanford University and a research engineer from Portland, Oregon, have just completed the first phase of a project that may revolutionize medical education.

The project is a complete atlas of human anatomy in three-dimensional Kodachrome transparencies, each keyed to a matching diagram drawn to scale.

Dr. David L. Bassett, associate professor of anatomy in the Stanford Medical School, and his colleague William B. Gruber, inventor of a modern stereoscope known as the "View Master," have finished the painstaking task of photographing 238 related dissections of the human central nervous system alone. It has taken them two years to complete this section of the steroscopic atlas and it will be published early in 1952. It will take them six to eight years and some 2,000 dissections and photographs before their monumental project is consumated.

Although the view can be projected onto large screens, the three-dimensional quality being maintained by the use of special glasses for the spectators, the most common use of the Kodachromes is expected to be with the compact and convenient hand viewer.

Preparing the specimens is exacting work. The tissues must appear as nearly identical to living tissues as possible. To prevent the discoloration usually seen in anatomical material, the blood vessels are flushed with salt solution before embalming. Arteries are then filled with red latex rubber, while the veins are filled with blue. As a result, the specimens appear so startingly clear in the finished view that the observer is reassured by the accompanying text that he is looking at a picture of real human tissue.

Dr. Bassett often spends a week or more preparing one specimen for the camera. He begins to dissect at the surface of each speimen and works inward. Photographs are made at successive stages of each dissection to show nerves, vessels, layers of connective tissue, and muscles in their normal relation to each other.

One especially valuable feature of the new atlas will be its series of stereoscopic x-ray views. Although three-dimensional x-rays are used to diagnose such irregularities as brain tumors, they are not commonly available for study outside hospitals. Dr. Bassett makes use of them in the new atlas to show the depth relationship of organs, vessels, and bones to each other.

The Gastro-intestinal Tract And Stool Following Aureomycin Therapy*

Royal L. Brown, M.D.

Glossitis, pharangytis, proctitis, and perianal erythema and fissures have been described following the administration of therapeutic doses of aureomycin and other antibiotics. "Aureomycin diarrhea" of varying degrees and longevity has also been observed and reported. Notwithstanding, no planned, comprehensive study has been published previously on the effect of aureomycin, or other antibiotics, on other segments of the gostro-intestinal tract, nor on the physico-biologic alterations of the stool during and following initial and repeated aureomycin therapy. The purpose of this paper is complementary in that it presents the gastro-intestinal response and stool alterations in the nonsensitive, uncomplicated clinical patient to aureomycin therapeusis.

HISTORY

Aureomycin was extracted from a new species of soil *Actinomycete,* now *Streptomyces aureofaciens,* in 1947 by Duggar.[1] It is readily absorbed into (0.5—3 hours), and fairly rapidly excreted from (2—72 hours), the human body.[2,3] Approximately half the oral intake is excreted unchanged in the urine and feces. It enters into the cerebrospinal, pericardial, pleural, and peritoneal fluid—also bile, feces, urine, milk, eye humors, exudates, and transudates. It has no blood-organ barrier. Toxicologically, its mild symptom-producing properties are ordinarily negligible when administered in therapeutic doses.[4]

Brown[5] was the first to describe glossitis with glossodynia, pharyngitis with pigmentation and desquamation of the pharyngeal and lingual epithelium, and superficial structures of the filariform papillae following the oral administration of the antibiotic, penicillin. More recently, similar phenomena have been observed following the oral administration of other antibiotics, including aureomycin. Harris[6] made the contributing observation that a significant number of the oral, anal, and vaginal lesions in aureomycin-treated patients are complicated by a superimposed candidiasis (moniliasis). Erythematous lesions characteristic of hypovitaminosis B also are observed frequently in protracted antibiotic (primarily aureomycin, terramycin, and chloramphenicol) therapy.[6,7] These lesions also are not infrequently secondarily invaded by *Candida albicans.*

TECHNIC AND PROCEDURES

Twenty-five ambulatory patients who, so far as could be determined, had no suppurative, hemorrhagic, or desquamative gastro-intestinal lesions, atopy, melena, or pyochezia, constituted the survey subjects of this study. Dosage of aureomycin was 750-1,250 mg. daily for 4 to 10 days. Sixteen of the cases have had 8 to 32 repeated

* Statistical accuracy is not intended in the findings of this numerically small survey.

courses of therapy. One (32 repeats) has received a total of 196,000 mg., without untoward drug reactions or complication sequelae.

A premedication stool was examined macro- and microscopically as a standard of comparison; 1-5 stools were examined similarly during aureomycin therapy for deviations from this established standard. All patients were mildly febrile (98.8—102.4 F.) with coccal or viral respiratory infections, sinusitis, or mild to moderately severe exacerbation of rheumatoid arthritis.

The microscopic fecal examinations were done on films prepared as usual,[8] fixed in Schaudinn's fixative, and stained (1) with iron hematoxylin,[9] (2) with sudan black B,[10–13] for lipids, and (3) with mucin stain.[14] The iron hematoxylin stained slides were prepared by conventional technic.[8,9] The sudan black B slides were prepared by the Brown technic. The fixed films were submerged upside down in the stain dish to prevent accumulation of precipitated stain and were then mounted in Karo.[10–13] Mucin, the glycoproteins of mucus, was evaluated by the Leach procedure.[14] Microscopic examinations of stained feces were concerned with the presence or absence of erythrocytes, leukocytes, epithelial or other host cells, *candidus*, and abnormal mucin and lipid constituents.

RESULTS

Clinical Observations

No untoward drug reactions, such as dermatitis, neurologic signs and symptoms, or other moderately severe symptomatology-indicating drug toxicity or allergy, were observed in this group of patients. The observed symptoms and signs commenced two to five days after therapy was instituted and occurred in 7 repeats and 2 initial cases receiving 250 mg. of aureomycin four to five times daily. Symptoms and signs objectively or subjectively identified, or else mildly complained of, during therapy were*: nausea without vomiting, 2 (8 per cent); glossitis and glossodynia, 8 (32 per cent); oropharangitis and pharyngodynia, 7 (28 per cent); gastritis with epigastric burning, 3 (12 per cent); colitis with tenderness, 5 (20 per cent); mild to moderately severe rectalgia, 4 (16 per cent); scanty bleeding from an erythematous, fissuered anus, 3 (12 per cent); and oral, anal or dermatologic candidiasis, 4 (16 per cent). Only 9 patients of the 25 (36 per cent) complained of any of these conditions; the sex ratio was 6 females out of 16 and 3 out of 11 males. Repeated therapy in full dosage (1—1.25 Gm. daily), without exception, produced recurrence of previous drug symptomatology and activated dormant patches of candidiasis. All 25 patients (100 per cent) had one or more loose bowel movements.

Several of these symptoms frequently occurred simultaneously in all patients having objective findings. Illustratively all instances of "burning" colon with slight tenderness (20 per cent) also had a degree of glossodynia and oropharyngodynia. The patients with epigastric distress and moderately severe rectalgia (one developed hemorrhoids) also complained of generalized but mild gastro-intestinal discomfort, e.g., "burning," "tenderness," "abdominal pain," "cramping rectal pain."

The comparatively mild nature of all conditions under treatment in this group of patients contributed to their ready detection of any symptomatology for which aureo-

mycin was etiologically, directly or indirectly, responsible; yet at no time was therapy discontinuance considered objectively nor indicated subjectively.

The observed lesions usually remained localized or restricted to a single system. The glossitis was characterized by redness, with some brownish discoloration of the filaments of the filariform papillae, and slight edema as evidenced by increased depth of the longitudinal lingual fissure and the marginal teeth impressions. Cheilosis with mild cheilitis was observed in 3 cases with glossitis, pharyngitis, and distress elsewhere in the gastro-intestinal tract. The mucous membrane over the hard and soft palate was involved frequently and effected similarly. Frequently, a hyperemic line of varying width was present near the free margin of the soft palate. The uvula was actively hyperemic early and observably edematous later. The lesions of the oropharynx on unaided visualization were consistent in characterization. Lingual patches of candidiasis were observed and identified in 2 patients.

The remainder of the pharynx and esophagus, when involved, were similarly reddened from active hyperemia. A brownish drug discoloration not dissimilar to that on the involved tongue frequently appeared and persisted for several days or until removed by epithelial desquamation. These involved areas likewise appear mildly edematous The stomach of the patient who had epigastric distress arising from aureomycin similarly showed gastroscopically some hyperemia, edema, and limited light brownish discoloration. Superficial exfoliation (ulcerous, not peptic ulcer) was present in a limited fundic area in one instance. The rectum and anus were quantitatively less definitely involved than the cephalic portion of the gastro-intestinal tract; nevertheless, qualitative lesions from the drug, hypovitaminosis, and candidiasis, descriptively similar to those found elsewhere, were present. Anal fissures and perianal erythema occurred infrequently (4 per cent) in cases on short therapeutic regimen; prolonged therapy and recently repeated treatment frequently resulted in perianal, as well as perioral discomfort, with later lesions comparable to those of clinical hypovitaminosis B complex.

Laboratory Findings

Macroscopic Fecal Examination. Commencing one to three days after initiating aureomycin therapy, the stools became bulky in quantity, loose in texture and semi-inspissated in consistency. The usual odor was decreased and altered. Particles from their periphery diffused rapidly into the surrounding water, suggesting decreased content of mucus. Characteristically, one to four such defecations occurred daily and persisted for two to ten days. They were then replaced most frequently by compact, rigidly morphic, scybalous stools. Normal texture of stool, quantity of feces, and interval between evacuations usually returned five to twenty days after cessation of therapy. No increased discoloration from blood other than scanty streaks of fresh blood in the 3 cases with rectal erythema and anal fissures were observed macroscopically.

Microscopic Fecal Examinations. Films of feces from aureomycin-treated patients adhered poorly to the microscopic slide during spreading and fixation; this decreased adhesive quality also suggests a quantitative decrease in mucin. Increased size of cellulose-bearing food particles was also a definite factor in this faulty adherence. Lynch's qualitative mucin stain test gave no indication of this decrement. Lipophilic sudan black

B stain gave no quantitative evidence of total lipid increase or decrease. Increase in erythrocytes during or after aureomycin therapeusis was not significant in any except the 3 cases with anal fissures. Occasional leukocytes, most frequently neutrophiles, and less often phagocytes were observed in the stools from the proctitis and fissure cases; by comparison they were not significantly more numerous than in the respective pre-aureomycin control slide. No microscopic clumps of mucus nor increased number of gastro-intestinal epithelial cells were observed. Candida was observed microscopically in only 9 of the 25 cases; only 3 showed abnormal numbers on direct examination of stools and mouth. No viability nor virility tests were made on these organisms. An inguino-perianal case of candidiasis was activated by aureomycin after it had been quiescent for several previous years.

DISCUSSION

Aureomycin Diarrhea

All 25 aureomycin-treated patients had one to several moderately large, loose, "bulk-type" bowel movements during the first to third days of initial or repeat therapeusis; 4 persisted to the fifth day, 1 to the ninth. These were frequently followed by mild, perhaps compensatory constipation. While the exact explanation for these phenomena remains enigmatic, nevertheless, several relative observations may contribute to the correct explanation or explanations.

Firstly, approximately one-third of the usual human stool as dry weight is bacterial, consisting chiefly of gram-negative and fewer gram-positive, acidophilic bacteria. Many of these bacteria are sensitive to therapeutic doses of aureomycin and thus, following therapy, would, as dead organisms, contribute directly to the initial increase in fecal bulk; also, after passage, indirectly to its subsequent decrease. In substantiation, test tube dilution cultures of pre- and post-therapeutic feces did show a marked reduction (33-89 per cent) in the number of bacterial colonies. *Escherichia, Streptococci, and Staphlococci* (*Micrococci*) were markedly reduced after three or more days of 250 mg. aureomycin q.i.d. Additionally, other bulk-contributing microorganisms may well be unable to continue inhabitation of the gastro-intestinal tract with its altered physiology during, and temporarily following therapeusis.

Secondly, some of the bulk may originate from the inevitably altered lipid metabolism resulting from the changed or depleted concerned intestinal bacterial flora.

Thirdly, a clinical or subclinical aureomycin-induced hypovitaminosis B may be a contributing factor.

A fourth factor, with some credence, is an aureomycin-induced normotonic effect on the intact intestinal wall. Substantiatively, it was observed that the 3 patients who had pretherapeutic spastic or mucospastic colitis, with painful evacuations of morphologically attenuated and often mucoid stools, had complete relief while on these short, repeated regimens of aureomycin therapy (750-1,000 mg. daily for 3 to 10 days). These patients had no complicating drug reactions, hypovitaminosis B signs, nor candidiasis either rectally or perianally which might have influenced the observed response. Their stools during therapy increased to normal diameter, and their spasm distress was relieved

subjectively and objectively. Subjective relief in ulcerative colitis during aureomycin therapy also had been significantly reported by Marks, et al.[15]

In explanation this spasmolytic type of relief may be accounted for by: (1) a direct pharmicologic relaxant action on the intact intestine by aureomycin; (2) a specific antibiotic action versus an intestine-inhabiting microorganism which produces a spasmogenic irritant or other spasmomimetic agent. While the "antispasmodic" action could not be verified kymographically, using muscle strips from the rat and cat colon, nevertheless, further pharmacologic evaluation is indicated on the premises that other than the artificially established *in vitro* factors may well have been active *in vivo*. Conclusively, the pharmaco-chemical composition of aureomycin is insufficiently established to date to characterize such limitedly observed action as being "antispasmodic," "antihistaminic," or simply antibiotic with consequent elimination of a biologic or biochemical spasm-producing factor.

Candidiasis

Dorman *C. Albicans* as etiology of a previous clinical or subclinical dermatitis, proctitis, glossitis, vaginitis, etc. frequently grows luxuriantly and virulently in man during aureomycin (also terramycin and chloramphenicol) therapeusis. While the reason or reasons for such reactivation or activation remains conjectural, nevertheless, some observations on host-parasite-antibiotic relationships may be pertinent to the solution.

The incidence and severity of pulmonary candidiasis has not been observed to increase consistently in patients receiving antibiotics, thereby indicating some selective retention of an anticandidiasis response by some host-tissues during therapeusis.

Previous candidiasis sites are activiated but usually remain fairly well delimited without generalized fulmination thereby suggesting the retention of the normal barriers to parasitism by previous nonparasitized host-tissue. This is in contradistinction to involved areas.

Cessation of antibiotic therapy frequently results in spontaneous improvement of the mycotic lesion usually with an ultimate reversion to its essentially dormant condition, suggesting a reversion of the *candidus*-promoting factors following discontinuance of therapy; at least a re-established host-parasite balance favoring the host. Normal host immunologic responses may not completely explain this phenomenon thereby necessitating a postulated *candidus* factor or antihost factor in aureomycin or its metabolic intermediates.

The fissures of cheilitis and proctitis of hypovitaminosis B origin whether induced by malnutrition or by antibiotic therapy are not infrequently secondarily infected with *C. albicans* suggesting a host-tissue deficiency of an essential factor which Candida apparently autometabolizes facultatively or otherwise for its own needs.

Absence of phagocytosis of *Micrococcus pyogenes* by leukocytes treated with subtherapeutic doses of aureomycin[17] may similarly suggest decreased host immunologic factors versus Candida during aureomycin therapeusis.

Growth rate as measured by weight gain is increased in some animals fed aureomycin,[18-22] suggesting that the introduced antibiotic factor prevents weight loss from

infections to which these animals are predisposed and vulnerable. The ineffectiveness of the antivitamin factor in these instances remains unexplained. Additionally, a nutritional factor also may be provided directly or as precursor by the aureomycin. The parasitized host-tissue, furthermore, may be physiologically faulty having incomplete capacity to utilize available essential factors. This again would favor parasite over host in its competitive relationships.

Obviously from presented observations, aureomycin either kills vitamin-producing bacteria or else critically curtails their output, thereby producing host hypovitaminosis. Candida, insofar as is known, facultatively produces or obtains its factor needs; thus this parasite would unlikely suffer from host nutritional deprivations, and, aureomycin would favor it preponderantly in its drug-parasite-host relationships. In accounting for the selective luxuriant growth of *C. albicans*, it would appear further that either a Candida growth-promoting factor is directly provided by aureomycin, (similar to that of yeast and other fungi), is metabolically produced from aureomycin as precursor, or else is provided indirectly in increased amounts by a sparing action artificially created when the competing bacteria are destroyed through antibiotics. Factors normally adequately provided may thus rapidly undergo acute shortage with resulting deficiency signs and symptoms in the host and a luxuriant growth of the parasite—the *status quo* condition. That bacterial antibiosis and host-parasite competitive relationships for growth factors are involved is further evident in the fact that local application of aureomycin (3 per cent ointment) has not been observed to stimulate a dormant candidiasis of the skin or tongue to acute activity. It also lends further credence to the idea of an intermediate metabolite which favors *candidus* in its parasite-host relationships.

SUMMARY

1. Aureomycin in therapeutic doses (1-1¼ Gm. daily), not infrequently causes mild but significant gastro-intestinal symptoms and signs; these include chemical, fungal and hypovitaminosis B glossitis, stomatitis, pharyngitis, esophagitis, gastritis, colitis, and proctitis. If the etiology is simply the drug, all the relative symptoms regress and the signs disappear within days after therapy is discontinued. Hypovitaminois B and candidiasis lesions respond to specific therapy or improve with time.

2. The uncomplicated aureomycin lesion was characterized by hyperemia, mild edema, and brown discoloration; the hypovitaminosis lesion was characterized by early development of erythema with frequently associated fissures; the candidiasis lesions were frequently recurrent and descriptively classical.

3. Symptoms were nausea, glossodynia, oropharyngodnia, epigastric distress, colon tenderness, rectalgia, abdominal distress, and the symptoms accompanying hypovitaminosis B complex and candidiasis lesions.

4. Additionally, several bulky, loose stools occurred during therapy; they became compact and scybalous within several days.

5. Microscopically, the feces showed no abnormal nor increased cell count. Mucin content was apparently decreased. *Candida* was increased as determined by the observed numbers of cells per microscopic field in positive cases and also in incidence.

6. An antispasmodic effect on spastic and mucospastic colitis appears to be present.

7. Aureomycin may promote hypovitaminoses B complex lesions some of which develop superimposed candidiasis. On the basis of presented evidence it would appear that at least two factors may be concerned, i.e., a depletion of bacterially-compounded vitamins upon which the host but not the parasite is dependent and a direct factor which is conducive to increased *Candida* growth.

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PSYCHOPATHOLOGY FOR THE GENERAL PRACTITIONER

On the Question of Iatrogenic Psychosis

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"An excellent drug is learning, but no drug is powerful enough to keep itself from change and corruption if there are baneful qualities in the vessel that contains it."—*Montaigne.*

Because the physician fulfills the double role of medical expert and father-surrogate, his spoken or inferred judgments are regarded with much respect by his clients. Although the literature abounds with articles which describe patients' favorable reactions to doctors' spoken or silent suggestions, essays dealing with illnesses which practitioners have aggravated or perhaps even caused are rare to a degree which is not representative of the actual statistics. The question of iatrogenic illnesses and symptomatology is rather inadequately handled in psychiatric textbooks and scarcely mentioned in other medical manuals.

It is commonly recognized that neurotic symptoms, usually of a physical nature, can be aggravated, fixated or actually determined by physicians' ill-timed, ineptly phrased, inaccurate or too-strenuously stated opinions.[1,2,6] Military and civilian experiences alike have illustrated the tendency of patients with functional ailments to focalize anxieties upon somatic scapegoats after their physicians have manifested excess concern through prescribing unnecessary laboratory and other diagnostic procedures, needless medicines, and useless inactivity in a sick-room environment.[4] Sometimes hypochondriac delusions have been ascribed to physicians' errors.

In the present article, the histories of three women will be presented in synopsis. Each of these patients apparently became psychotic following some action of her physician. An attempt will be made to evaluate the contribution played by the doctors involved, and certain recommendations will be tentatively offered which may help reduce iatrogenic symptom (and possibly even illness) formation.

CASE REPORTS

Case 1 was a housewife in her forties. For about five years she had attended an internist for minor symptoms associated with menopause. He had sparingly prescribed hormones and sedatives and she had responded well. He had been careful to regularly explain to her what the medicines were expected to do. Eventually, she was taking small amounts of phenobarbital in tablet form. One day, without comment, he changed her prescription to liquid form and added a little belladonna. She took a dose of the medicine as directed and felt a burning sensation in the epigastrium. She immediately worried that he had changed the medicine because her condition was worse in some mysterious way. She became tense and insomniac and rapidly developed a delusional system based

upon the theme that doctors were in league against her family and were trying to poison her, her husband, and her daughter. She quickly deteriorated into a helpless psychotic whose memory was absent, who was disoriented, and who spoke irrelevantly and incoherently. She was hallucinated.

Information concerning her family and past were but sketchily obtained. Her father was a stern, demanding artisan. When she was eighteen, he developed a manic-depressive psychosis for which he was intermittently hospitalized until his death twenty-five years later. The paternal grandfather and a paternal aunt were reputedly psychotic. The patient's mother had been a meticulous housekeeper. Her interests were centered entirely in her home. The patient had numerous siblings. She had nothing kind to say about any of them with the exception of a younger brother and a sister who had long since died. During the patient's childhood she was enuretic and a thumbsucker. She had nightmares depicting the deaths of members of her family. She lived in fear of her father's gruffness and strictness. She left her country grammar school to go to work and held the same sort of job for thirty subsequent years. It required following routine and permitted no originality of behavior. Information concerning her sexual life was not obtained, except that she had two "miscarriages" and one full-term, normal child. In her marriage she was completely dependent upon her husband for decisions and behavior requirements. His demands upon her were most lenient. It was evident from my dealings with him that he felt little if any hidden hostility toward her and identified her with a good mother. She was an exceedingly careful housekeeper and an unbending conformist to convention. The opinions of others were all-important to her. She reared a daughter who was apparently happily married and physically healthy.

She was hospitalized and given electroshock therapy. She quickly recovered from her psychosis. Although she refused to have follow-up interviews, six weeks after her discharge from the hospital her husband reported that she had regained her former personality.

Twenty-one months later the patient went to see a physician because she had experienced some sensations of vaginal dryness and a little spotting. She had previously consulted him upon occasion for minor complaints. Each time he had had his nurse give her injections of medicine, dispense pills, or capsules. Either he or the nurse had explained to her what the drugs were and what their administration would cause her to feel. On this occasion, however, he did a pelvic examination in the absence of the nurse. Then, without comment, he inserted a vaginal lozenge and gave her an injection into the buttock, while she was still on the examination table. The patient regressed to psychosis within two days. An elaborate system of delusions was mixed with depressive material. There were again elements of organic confusion. Hospitalization and electroshock therapy resulted in quick remission. Once more, she refused to appear for follow-up care.

Case II was a housewife in her forties. She was the third child, her siblings being brothers. Her mother was a coldly rigid, domineering woman. She favored her sons and placed the daughter under the care of a nursemaid during her first five years. She herself mothered the sons. Absolute conformity to maternal demands was required. Sexual and aggressive behavior or spoken thoughts were forbidden. The patient grew up sufficiently

dependent that at the time she was seen by the author, her mother still bought and selected her clothes and gave her an allowance for being a good girl. Her father was a financially successful attorney. At times he protected her from the treatment of her mother. He, too, was a strong and determined man. Other information concerning him was not obtained. Her relationships with her brothers were also a mystery at the time this article was written. Because of the mother's snobbishness, the family moved from neighborhood to neighborhood in search of social equals. The children were forbidden to play with other boys and girls because their contemporaries were considered unacceptable. The patient grew up to be shy. She found occasional teachers who seemed to like her. In Sunday School and in studying piano she had such instructors. To win their favor, she worked intensely hard and did fairly well. When she was sixteen, she seemed to tire easily. A doctor saw her over a period of four years and treated her for "anemia." He repeatedly warned her she must not "overdo." When she was in high school, she developed romantic feelings for a classmate. She had fantasies of marriage. When he did not reciprocate her affections, she became morose and withdrawn for some weeks. In college, the same sort of situation developed. Her reaction to her disappointment at that time was to withdraw into her self to the extent that she failed in school and stayed out of classes for a year, spending her time almost exclusively in the company of her mother. She finished university work and after business training became a statistical worker in a position where her movements were dictated and of a routine nature. The man with whom she had thought herself in love when she was in college began to write to her. She again had thoughts of marriage and once more was disappointed. She became tense and insomniac. Her work efficiency diminished. She consulted a clinical psychologist whom she called doctor. He placed her on a couch and saw her daily, sixty times. He directed her to masturbate, have affairs, give up all religious practices and not to marry without having lived with her prospective husband for some months. All of the dicta were antipodal to her training. Nevertheless, she followed his recommendations. She began to have an affair with a fellow employee, a highly dependent, schizoid individual whose contact with reality was preserved by a severe, obsessive-compulsive character disorder. After a year she forced him into marriage by threatening departure. She continued to work until she became pregnant; a son was born four years after their marriage. The patient became helpless. She could not bring herself to care for him despite much guilt. She was tired and bewildered. It was necessary to have constant household help. He had severe feeding problems, was always ill, and had temper tantrums. She took to her bed. When the husband came home at night, he found the child filthy and crying; the walls smeared with feces. The child was literally caged during the daytime; the mother would be in another room. She could find no physical cause for her illnesses. Neither could the many doctors who were summoned. Eventually, the son was placed in a succession of different homes. The patient began to have two soft bowel movements per day and complained to a physician that she had diarrhea. That doctor was very interested. He took frequent stool cultures and said that her bacterial flora were exceptionally virulent. Before long she was convinced that she had a serious intestinal infection. Because of withdrawal and depression, she was placed in a psychiatric sanitorium in a neighboring state. She remained for seven months. According to her story, the doctors there felt that she should be forced into

activity and treated her by studied neglect. Only the most superficial of brief and infrequent psychiatric interviews were conducted. In the hospital summary, she was diagnosed as "psychoneurosis, anxiety state, with possible mental deficiency." The record contains the remark: "During her stay at the Sanitarium the patient improved gradually, but she was still very delusional about the condition of her bowels and had short periods of depression." When she went home, full time help was employed. For six years she remained in bed, totally dependent upon others. Several psychiatrists were called to the house, but each was seen only once or twice. Then an internist was consulted. He was very interested in the utilization of antigens. He ran numerous fecal cultures and, although her bowel symptomatology was unchanged, concurred that she had a serious intestinal infection. He treated her with various courses of antigens and bacteriophages. In addition, that doctor was of a strongly religious bent. He saw her thrice weekly for some years. During each interview he would spend about half an hour with her in mutual prayer and in exhortation that she put her trust in God. She improved somewhat and was eventually able to be up for a few hours per day. She still accepted no responsibilities. Her son was permitted to come home. To care for him, a woman who had a son his age was hired. After about two years the patient became jealous of the woman, who seemed to be interested in her son and who occasionally made cookies for him. She developed the delusion that the woman was in league with her husband, either to steal the boy away from her or to poison him. She determined she would get rid of the housekeeper and care for her son herself. However, she first complained to the police who investigated the case. For the next year she took care of the house in a very limited way, with the help of various part-time maids. Then the doctor who had been so close with her moved to another country. She rapidly deteriorated. Another physician who dispensed antigens and bacteriophages was able to temporarily help her with more of those drugs. She briefly improved but then quickly became worse. Her husband strove to commit her. She was hospitalized for observation. Her attitudte was strongly dependent and childlike. Although her speech was relevant and coherent, it wandered, so that history acquisition was most difficult. The delusional system determined her pattern of living. Although physical and laboratory examinations revealed no abnormalities, she was unshakably convinced that she had a severe bowel infection caused by a combination of virulent bacteria and her own sensitivity. She did not dare arise from her bed and assume responsibilities because such activities would weaken her. My contacts with her husband disclosed his intense inner wish to keep her psychotic. As long as she was weak and bedridden, he had reason to avoid sexual relations, which, according to his delusional system, would sap his strength. Then he would be too weak to appropriately care for his aged mother.

The son of this marriage had severe personality problems.

Case III was a secretary in her late forties. Her mother was a harassed, overworked woman who was strict and rigid in her viewpoints. She was absolutely set in her belief that complete obedience and silence were the roles for children to follow and that sex and aggression were intolerable. She had no use for her husband, a railroad conductor, who was cold, demanding, stubborn and opinionated and of whom the children were in constant fright. Nevertheless, the mother did her best to maintain a home for the

children despite financial hardships brought about by the father's refusing to conform with job rules and being sometimes out of work as a result. For example, one time his freight train was sidetracked to let a passenger train have the right of way. The latter was detained and it seemed as though he might miss his dinner. He ordered the freight train on the track to continue its journey. If the passenger train had come sooner than it did, there would have been a serious wreck. There were brothers, all of whom were very obviously favored over the sisters, of whom the patient was the middle one. She felt always left out and mistreated from every side. She idolized a brother ten years older than she, one who, it seemed, could do no wrong. As a child, she struck up a friendship with an old man who lived nearby. He took her ice-skating and bought certain toys for her. These two men provided what affection and attention she felt she received as a child. She was bitter and sullen; obedient but grimly so. She conformed and resented the conformation. When she was in her teens, she met and encouraged the attentions of a transportation man old enough to be her father, a man who was by reputation a roué and who had children by a divorced wife. She seduced him and became pregnant three times by him. After two abortions, she forced him to marry her. Her actions in dealing with him were hostile and dependent. He eventually left her and never returned, not even to see their daughter. Despite the fact that at the time of this writing twenty-two years had elapsed, the patient had not procured a divorce. Her treatment of her daughter was marked by ambivalence. Although she shouldered the financial burden, she placed her daughter with relatives and in schools. She had little to do with her family and she did not go to see her mother for some years, even when the old woman was on her deathbed. She did not attend the funeral of either parent. When her father was old and decrepit, she knew he was very poor and despite being almost eighty was having to support himself. She contributed nothing to his care, nor did she see him. Throughout her life, she was cold, aloof, hostile, and efficient. When she took her daughter to live with her, she was domineering and possessive. After her father's death, she moved in order to be near her erstwhile worshipped brother. She immediately fell in love with her employer, a man who looked just like her father and whose actions were a combination of those of her husband and father. She did not permit him to know of her feelings but treated him coldly and with hostility, veiled with efficient compliance to the demands of her job. She was friendless. She denied to herself the need for friends and felt she was living for her daughter. For four years she attended a general practitioner for various ailments, including headaches which were attributed in part to a moderate hypertension. Then she began to have abdominal pains. Surgery was recommended. The patient was informed that she had a uterine tumor but was not told that other conditions might exist. No mention was made that she might require ovariectomy. At surgery, the uterus and both ovaries were removed. The patient rapidly developed a psychosis with paranoid and depressed features. This patient has been discussed elsewhere.[3]

It is clear from the case histories that each of these women suffered from a psychologic disturbance before the onset of her overt psychosis.

Case I lived a life which could be considered adequate. She reared a daughter who was happily married and well adjusted. She maintained a household and performed her

wifely duties satisfactorily. Simultaneously, she held a moderately responsible job for many years without difficulty of any sort. However, her seeming normality was sustained by the employment of rigid behavior patterns. Her prepsychotic personality would be best described by the phrase compulsive character disorder. She was dependent and it was necessary that prescribed rules at all times be present. She lived by conformity and could not tolerate original behavior or thinking.

Case II had successfully, although with some difficulty, completed her university courses. She had worked to partially support herself for some years before her marriage. She had continued to work and had performed adequately her household tasks until the time her child was born. Nevertheless, her childhood and youth were remarkable for her extreme dependency and conformity. She exaggerated the significance of her early romances and assumed that the men felt as she did. Then the separations either caused or were coincidental with pathologic psychologic reactions of a schizoid type. Her response to the advice of the clinical psychologist can be explained only conjecturally. No information had been obtained concerning her youthful reactions to paternal and fraternal standards. However, throughout her marriage she followed her husband's dictates without question. Hence, we may assume that she conformed to paternal as well as to maternal demands. Her later reactions to doctors make it reasonable that we conclude that she identified the psychologist with her father; hence she was able to act according to new standards without great question. Obviously, a very weak ego and a faulty, externalized superego are thus illustrated to have existed before her manifest psychotic break. The reaction to her son's birth was of a phobic nature and, viewed retrospectively, suspiciously schizoid. Nevertheless, no doctor diagnosed her as psychotic and no delusional patttern was patently present until she was hospitalized. The psychiatrist who referred her to the sanitorium diagnosed "inadequate personality."

Case III had supported her daughter and herself adequately from a financial standpoint. She had been an efficient business woman. However, she was hostile, asocial, and suspicious. She could not tolerate intimacies with anyone. She was prejudiced and bigoted and bore grudges. In short, she fundamentally suffered from a paranoid character disorder. Despite her having broken with certain members of her family, her superego standards were clearly theirs and her life was bound by rigid conformity of thought and action.

THE DOCTOR'S ROLE

Men and women choose medicine as their professional field for reasons which at times are entirely unconscious. Medical students and physicians who have sought the present author's psychiatric help have revealed interacting motivations of varied importance. Sometimes the unconscious aims have been handled by reaction formation and on other occasions, sublimation has predominated. Consciously, these patients decided to become doctors for the prestige and financial gain they would acquire and in order to help their fellow men. Preconsciously or unconsciously, they sought to satisfy other desires. In some cases, there was an identification with the patients. The doctors in those instances sought to give themselves the care they felt they had not received as children. Some had become doctors as part of their utilizing the ego defense mechanism of

identification with the aggressor. They identified with father figures and performed upon their patients what they feared their father would do to them. Sometimes they acted out upon their patients-children the sadistic behavior they had received in reality and in fantasy from their own fathers and fathers-surrogate. Other patients had maternal identifications which they tolerated through being physicians. Doctors frequently unconsciously sought to satisfy their childhood curiosities concerning parental sexual and excretory actions and functions, and anatomy. All of these motivating forces interacted simultaneously with varying predominance. The members of every medical school admissions committee know the large percentage of applicants who are overtly neurotic.[5] Student health physicians attest to the high incidence of neuroses among medical students and resident staffs.[7]

For obvious reasons, exact information cannot be given about the physicians who treated the patients described in this paper. The data concerning the patients have been sufficiently distorted that the personalities involved cannot be known from the summaries. The material regarding the physicians will be presented in a concise and accurate manner which will not reveal the identities of the men described.

None of the physicians depicted in this article was a patient of the author. However, from knowledge known personally to him and from sources which are reliable, the following information was obtained.

The first physician of Case I was a brilliant internist and scientist. He was long known to his associates to have suffered from a paranoid character disorder and to have been sarcastic and even sadistic in his dealings with subordinates. In research programs, he was known to have the delusion that his partners stole his ideas and claimed credit for them when in reality it was he who treated them so. He particularly reacted to female doctors with hostility and contempt. It was common knowledge that he had had marital difficulties; at the exact time when he changed the medication of Case I, his wife was leaving him. He expressed open derision toward psychiatry. At the same time, he was a doctor who was generally kind with his patients, but he could not tolerate any question concerning his judgments. If his patients did not obviously adulate him, he immediately transferred them to other doctors. It seems entirely reasonable to assume that at the time his wife was leaving him, he felt especially antagonistic to women and acted out some of his hostility in dealing with his patients.

No information was obtained concerning the second physician of Case I.

The doctors who cared for Case II before her sanitorium treatment were unknown to the writer. Much information is available concerning the clinical psychologist. This man suffered from an impulsive character disorder which he tolerated through acting out his own desires in the movements of his patients. When he treated Case II, he was already suspected by his colleagues of beginning senility. The role this man played in the patient's subsequent psychosis can only be guessed. However, it is possible that his open suggestions in some degree further conditioned her to take other doctors' recommendations as commands. Two physicians cared for Case II in the sanitorium. The first was a kindly man who had a genuine interest in his patients and who was easily identifiable as a good father. However, his psychiatric education

wifely duties satisfactorily. Simultaneously, she held a moderately responsible job for many years without difficulty of any sort. However, her seeming normality was sustained by the employment of rigid behavior patterns. Her prepsychotic personality would be best described by the phrase compulsive character disorder. She was dependent and it was necessary that prescribed rules at all times be present. She lived by conformity and could not tolerate original behavior or thinking.

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THE DOCTOR'S ROLE

Men and women choose medicine as their professional field for reasons which at times are entirely unconscious. Medical students and physicians who have sought the present author's psychiatric help have revealed interacting motivations of varied importance. Sometimes the unconscious aims have been handled by reaction formation and on other occasions, sublimation has predominated. Consciously, these patients decided to become doctors for the prestige and financial gain they would acquire and in order to help their fellow men. Preconsciously or unconsciously, they sought to satisfy other desires. In some cases, there was an identification with the patients. The doctors in those instances sought to give themselves the care they felt they had not received as children. Some had become doctors as part of their utilizing the ego defense mechanism of

identification with the aggressor. They identified with father figures and performed upon their patients what they feared their father would do to them. Sometimes they acted out upon their patients-children the sadistic behavior they had received in reality and in fantasy from their own fathers and fathers-surrogate. Other patients had maternal identifications which they tolerated through being physicians. Doctors frequently unconsciously sought to satisfy their childhood curiosities concerning parental sexual and excretory actions and functions, and anatomy. All of these motivating forces interacted simultaneously with varying predominance. The members of every medical school admissions committee know the large percentage of applicants who are overtly neurotic.[5] Student health physicians attest to the high incidence of neuroses among medical students and resident staffs.[7]

For obvious reasons, exact information cannot be given about the physicians who treated the patients described in this paper. The data concerning the patients have been sufficiently distorted that the personalities involved cannot be known from the summaries. The material regarding the physicians will be presented in a concise and accurate manner which will not reveal the identities of the men described.

None of the physicians depicted in this article was a patient of the author. However, from knowledge known personally to him and from sources which are reliable, the following information was obtained.

The first physician of Case I was a brilliant internist and scientist. He was long known to his associates to have suffered from a paranoid character disorder and to have been sarcastic and even sadistic in his dealings with subordinates. In research programs, he was known to have the delusion that his partners stole his ideas and claimed credit for them when in reality it was he who treated them so. He particularly reacted to female doctors with hostility and contempt. It was common knowledge that he had had marital difficulties; at the exact time when he changed the medication of Case I, his wife was leaving him. He expressed open derision toward psychiatry. At the same time, he was a doctor who was generally kind with his patients, but he could not tolerate any question concerning his judgments. If his patients did not obviously adulate him, he immediately transferred them to other doctors. It seems entirely reasonable to assume that at the time his wife was leaving him, he felt especially antagonistic to women and acted out some of his hostility in dealing with his patients.

No information was obtained concerning the second physician of Case I.

The doctors who cared for Case II before her sanitorium treatment were unknown to the writer. Much information is available concerning the clinical psychologist. This man suffered from an impulsive character disorder which he tolerated through acting out his own desires in the movements of his patients. When he treated Case II, he was already suspected by his colleagues of beginning senility. The role this man played in the patient's subsequent psychosis can only be guessed. However, it is possible that his open suggestions in some degree further conditioned her to take other doctors' recommendations as commands. Two physicians cared for Case II in the sanitorium. The first was a kindly man who had a genuine interest in his patients and who was easily identifiable as a good father. However, his psychiatric education

level. If he could not rationally administer medicines or convulsive therapy of one had been skimpy and he had scant knowledge of the unconscious, even on an intellectual kind or another, he treated his patients only supportively, generally with the open encouragement technic. His lack of interest in the past of Case II is revealed by the fact that, while he cared for her for six of the seven months she was hospitalized, he apparently did not know she had been to college (the diagnosis included the term "possible mental deficiency"). She felt, because of his therapeutic approach, that he preferred his other patients to her. She concluded that he considered her to be malingering and treated her punitively by neglect. The second physician who cared for her there was commonly known to be hostile and authoritative in her treatment of patients. She, too, had but the barest knowledge of the unconscious. She was a rather exhibitionistic woman who had a masculine identification and whose walk, dress, and talk were aggressive. The patient felt this woman clearly disliked her. Although factors of identification of the female physician with the similar mother were undoubtedly present, the author has treated and otherwise known several other patients who had formerly consulted that sanitorium psychiatrist. They uniformly felt that she was angry with them and treated them with hostility and derision, as though she were punishing them for being psychologically ill. The doctor who cared for Case II for several years after she left the sanitorium was generally considered to be strongly schizoid. His colleagues thought his ideas and actions to be very odd. His behavior with Case II would indicate that he was suspiciously near psychosis. His treatment of other patients revealed a strong interest in anal functions. He cusomarily needlessly administered prostatic massage, for example. This man was married to a woman considerably older than himself and identified her with his mother. His treatment of his wife was so kind and so obsequious that one suspected the existence of a great store of repressed hostility. His removal from the area was stimulated at least in part by the onset of a senile psychosis in his wife.

Information concerning the last physician who treated her and the doctor who treated Case III is too inadequate to permit comment. However, just after this paper was drafted he committed suicide in a manner strongly suggesting that he suffered from paranoid delusions.

What, then, were the roles played by the doctors in the generation of the psychoses of these patients? It seems safe to conjecture that the physicians about whom there is enough information to speak were acting out certain of their own psychologic problems upon the patients. Those conflicts have been described above and their applicability is at least to some extent clear.

WHY DID THE PSYCHOSES ARISE?

Tentative answers can be given to the question, "Why did the psychoses arise?"

In Case I, the patient had maintained her contact with reality through employing a rigid compulsive character disorder. In her marriage, she was dependent and her husband was exceedingly tolerant. In my dealings with him, I found no evidence of hidden hostility toward her. Thus she had found in him the accepting father she felt she had lacked as a child. When she spoke of her first physician, her tone seemed to be a combination of adoration and disappointment. That father figure had failed her.

He had been curt and gruff with her, even though briefly, and she had been unable to continue to see him only as a good father. The established routine of behavior and expected response had been disturbed. That he at that time in reality was psychically upset and probably angry with women in general has been discussed. Apparently, there was an interaction of their psychiatric problems which proved intolerable to her weak ego structure. When her second episode occurred, again an established routine of behavior had been upset. Her delusions and hallucinations at that time were in part those of being impregnated by the doctor. This datum might lend credence to the hypothesis that the psychic effect of menopausal castration contributed to the onset of psychosis. It is unfortunate that the patient could not be reached for deeper psychiatric investigation.

Case II was initially schizoid, dependent, and suggestible. Her ego was patently weak. Her acting out of latent, proscribed desires was demanded by the clinical psychologist and increased guilt in her must have resulted. The sanitorium doctors added to her guilt and feelings of rejection by treating her punitively. The physician consulted for "diarrhea" before her hospitalization perhaps strongly contributed to the formal external expression her delusional system had assumed. The last doctor described certainly supported it, with his own (near?) psychotic behavior and his anal interest.

In case III, the problem may have been somewhat different. Psychotic reactions after actual and symbolic castrations are probably common. The doctor who removed her ovaries and without preparing her psychologically in advance also did not insist upon her seeking psychiatric care for one year after the onset of her psychosis. Could hostility in him toward her and psychiatry have played a part?

No proof has been presented that truly iatrogenic illnesses exist. There was strong indication that personality difficulties present in the patients were adversely affected by the problems of their physicians. It would appear that the symptom formation can be strongly influenced by the interaction of the psychologic aberrations of patients and their physicians.

RECOMMENDATIONS

Psychoanalysts believe that a fundamental knowledge of the complex structure and patterns of potential influence of the unconscious can be achieved only through extensive personal psychoanalyses and participation for many years in seminar groups coincidental with the actual practice of psychotherapy of various kinds. It is submitted that the curricular of various medical schools could be improved to provide facilities for students to deal more intimately with emotionally disturbed patients, under the guidance of proficient, practicing psychiatrists who themselves have achieved a working knowledge of the unconscious. The psychologic curricula of colleges and the lecture method of presentation of psychiatry in medical schools create the illusion that medical students are taught the operation of the human mind. This is true in only the most limited sense.

Particularly since the advent of World War II, there has been a general shift of

public and medical opinion toward the recognition of emotional and mental disorders as illnesses which were not the "fault" of those who suffered them. There has been a growing acceptance of the viewpoint that the same mental mechanisms are operative within all of us and that due to various circumstances, they are more quantitatively than qualitatively different. It is recommended that doctors take stock of themselves. If they are uneasy in their personal relationships or their dealings with their patients, they might seriously consider seeking personal psychiatric help. If they are acting out their problems upon their patients, they are practicing bad medicine as well as living unhappily.

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DUKE UNIVERSITY'S MEDICAL STUDENTS BRING MORE MEDICAL CARE TO RURAL NORTH CAROLINA

During the last half of their senior year Duke Medical students can take a two-week time out from a course in pediatrics and roll up their sleeves in a tour of duty with a country doctor.

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The purpose of Duke's exchange program is to create interest in general practice and give students an insight into the problems of the country doctor.

MEDICAL HUMANITIES

Disease And Therapy 4000 Years Ago

THE FIRST RECORDED HISTORY OF MEDICINE

R. de Roban Barondes, M.D., F.R.I.P.H., F.R.S.A.

VETERANS ADMINISTRATION
LOS ANGELES, CALIFORNIA

The great Assyrian nation, which dwelt on the banks of the Tigris and Euphrates some 4000 years ago, flourished in literature as well as in the plastic arts, and had an alphabet of its own. The Assyrians sometimes wrote with a sharp reed for a pen, upon skins, wooden tablets, or papyrus brought from Egypt. In this case they used cursive letters of a Phoenician character. But when they wished to preserve their written documents, they employed clay tablets and a stylus whose bevelled point made an impression like a narrow elongated wedge. By a combination of these wedges, letters and words were formed by the skilled and practised scribe who would thus rapidly turn out a vast amount of "copy." All works of history, medicine, law and poetry were thus written in the cuneiform or old Chaldean characters, on a substance which could withstand the ravages of time, fire, and water. Hence we have authentic monuments of Assyrian literature in their original form, unglossed, unaltered and ungarbled. In this respect, Chaldean records are actually superior to those of the Babylonians, Greeks, Hebrews, Armenians or Romans.

The Assyrian basic knowledge of the nature of infectious and contagious diseases, which antedates by many, many centuries Pasteur's germ theory, is truly remarkable. The Assyrians attributed the causative factors of disease to the influences of "Evil Spirits," of which there were many; for cures, they seemed to have relied wholly on charms, incantations, wax figurines, and the use of magic knots and talismans. They had a firm belief in the immortality of the soul; they worshipped some 5000 gods, and believed in inherited or imputed sins (disease).

The following* are only a few of the noxious spirits that were causes of afflictions of various parts of the body:

"The Burning Spirit of the Neck which seizes man; the Burning Spirit of the Neck which works evil, the creation of evil spirits. Wasting, want of health, the Evil of the Ulcer, spreading quincy of the gullet; the violent ulcer, the noxious ulcer. Sickness of the entrails; sickness of the heart, the palpitation of a sick heart, sickness of the bile, sickness of the head, noxious colic, the agitation of terror, flatulency of the entrails; noxious illness, lingering illness with incubus and nightmare, the cruel spirit

*All quotations are from translations of inscription on the Assyrian tablets resting in the British Museum.

the strong spirit of the head, the head spirit that departs the noxious head spirit, by the sickness that exists in a man's skin (leprosy), a man's flesh that consumes like fire (cancer?), the spirits of the holidays of plague that return; the Spirit of the heart; rest the mighty Prince Bel and may his liver be magnified (an enlarged liver considered a blessing?), and attain gray hairs and old age." "May Nin-ci-gal establish before the bile and burn up the sickness of the heart and head. Seven storm Spirits attack the moon in shadow those baleful allies of incubus, let the Fire-god seize and remove and bind. Inflict upon him the utmost contumely. May Istar load him with infirmities, and anguish of illness like arrows increase the pain day and night so that he runs like a mad dog in the city. Strike them with the plagues of the four elements; may Nebu, the great steward, supreme among the gods, like the god who has begotten him, seize upon his head, against his life may he not break forth. (Seven evil spirits at once might enter into a man to give "manifold affliction." They believed in great degree the holiness attributed to the number, seven.)

"The poisonous spittle of the mouth which is noxious to the voice; the phlegm which consumes the chest (tuberculosis), the pustules of the lungs, the pustules of the body, the loss of the nails; the removal and dissolving of old excrement; the skin which is stripped off; the recurrent ague of the body (malaria); the food which hardens in a man's body; the food which returns after being eaten; the drink which distends after drinking; death by poison; death from swallowing of the mouth which distends(?); the unreturning wind of the Desert;. To the Sun, the Judge supreme, who perfects good in my body, in tears I dissolve myself (?). From baldness and disease, this man cleanse, make him whole, head, feet and hands.

"The God Merodach, he deposited my germ (!) in my mother's womb, then being conceived, I was made."

The following quotations show precautions taken:

"May the Lady of the House of Death turn his face toward another place that the noxious consuming phlegm not seize upon another, and this propitious genie not settle upon anybody (!) "On the sick man by the sacrifice of mercy may perfect health shine like bronze; may the Sun God give this man life and health (actinotherapy); may he rejoice in his corporal health, in the satisfaction of his heart accomplish his wishes, attain his end. and may he render his magnificense seven times more imposing."

The following instructions were given on those dying apparently from infectious diseases: "Like the garden stuff, be rooted out and let the consuming Fire-god consume and take the dwelling place. Let the Fire-god then seize upon the incubus, and the Lady of the House of Death take the spirit to pasturage in Eridu." (This reference may be compared to the Green idea of Delphi as the central Omphalos, or "The Earth's Navel," also, "The Lord of the Canal.")

Many have searched in more recent records, e.g., the Bible for the first mention of the clotting of blood, but to no avail. Here is a quotation where such a phenomenon is recorded many centuries before this time.

"While Erich desolate doth cry to thee
Her blood like water in Ul-bar, Oh see.
And spear to spear, and sword to sword, till ran
The walls with gore—all Erech's men.
In silence Izdubar the warning heard,
His blood with terror froze, and then was stirred.
And lo! two dragons near a cave contend
Their path, with backs upreared their coils unbend,
Extend their ravenous jaws with a loud roar
That harshly comes from mouth of *clotted gore*."

To cure disease the preliminary steps taken were to guard the entrance of the sick man's house with warning signs (quarantine) written on parchment ("ligaments") which they believed had power to avert every kind of evil, and to drive the demons away:

"Guard carefully the sick man's chamber that nothing evil may enter nor leave the abode. Place the guardians, Hea and Marduk (statues), at the door, on the right and on the left. Spread out holy texts and sentences on ligaments. (Sometimes divine images were brought into the chamber, and written texts taken from holy books were placed on the walls and gates, and bound around the ill man's brows.) "Bind the right hand; loose it from the left; knot it with seven knots; sprinkle it with bright wine. Bind it (the holy sentences) round the head; the hands, the feet, like manacles and fetters, and Marduk shall find him a happy habitation." (A waxen figure was made and placed before the fire, and as it slowly melted, the person represented by it was supposed to similarly waste away. Exorcisms, incantations, charms and the like were wholly relied upon to drive away the spirit tormentors—these appearing to be the sole remedies employed, for no mention can be found on these ancient relics referring to any therapeutic agents other than, possibly, actinotherapy, warnings to keep away from contagious diseases, and other prophylaxis as the eating and drinking of pure products, bathing, and "the use of slit-trenches as not to foul the home-abode, and garden." (The latter is also mentioned in the Bible.)

The clue to the understanding of the cuneiform or ancient Chaldean alphabet was discovered in 1850 by Sir Henry Rawlinson, and described by him before the British Royal Society. Hence the knowledge of ancient Assyrian literature to Western readers is but some 100 years. Much of this material of age-old antiquity reposes in the British Museum; previously being recovered from the library of King Assurbanipal in the palace at Dur-Sargina—the city where stood the palace of Assyrian monarchs over 4000 years ago. ("Duran" was Babylonia.)

A poet known only as "Siulici Unnini" (literal translation: "O Moon-god, hear my cry"), has left an epic poem of great power and beauty in the imperishable tablets. This is the Epic of Izdubar; and was discovered by an eminent Assyriologist, George Smith, in 1871. The date of recording is estimated to be some 2000 years B.C. The translation from the original poetry into English poetry was by Leonidas le Cenci Hamilton. The legends are lithographed in the "Cuneiform Inscriptions of Western Asia," vol. II, plates 17 and 18; and being translated by Rev. A. H. Sayce. Other translations by M. Oppert appear in the *Journal Asiatique* (Jan. 1873) and an analytical

rendering of Babylonian Exorcisms by M. Fr. Lenormant appears in his *Etudes Accadiennes*, 11, 1 (1874).

Those readers who may be further interested in these ancient records of history, medicine, law, poetry, customs, etc., are referred to *Chaldean Account of Genesis* by George Smith, *"Records of the Past"* and *"Babylonian and Assyrian Literature"* (Colonial Press, 1901.).

Since submission of this article for publication, there has appeared in the November 1951 issue of *Scientific American* (pp. 54-55), a report of the recent discovery of an inscribed clay tablet, "The Sumerian Farmer's Almanac," a 3,500 year old document that was translated by Professor Samuel N. Kramer (Assyriologist) at the Museum of the University of Pennsylvania. There are two excellent reproductions of the cuneiform Chaldean tablets. These contain 35 lines from the middle of an agricultural handbook of which eight other fragments and tablets had previously been discovered.

ARTHRITIS FOUNDATION APPEALS

The Arthritis and Rheumatism Foundation of 23 West 45th Street, New York City, is now appealing for public support to carry on its fight to conquer this greatest crippler of mankind and to bring immediate relief to its millions of victims—one in every twenty of our fellow citizens.

Approximately 7½ million men, women, and children in the United States suffer from some form of arthritis or rheumatic disease. This is more than all the victims of cancer, diabetes, heart trouble, and tuberculosis combined. Of the total arthritis sufferers, nearly a million are wholly or partially disabled. The disease attacks mainly the workers between 20 and 50 years. The annual labor loss is estimated at 97,200,000 work-days; the annual cost in public relief to the disabled at $128,000,000.

Yet, up to a year ago, there were only 150 arthritis clinics in the whole nation, and these were mainly in eight larger cities. Fifteen states were without any arthritis clinic facilities at all! Only about 700 hospital beds in the whole country were occupied by arthritis patients.

The Foundation operates through a network of Chapters which work mainly to improve facilities for treatment of arthritis sufferers in their communities. They raise and provide funds to local hospitals for arthritis clinics, occupational and physical therapy, home treatment for bedridden patients. Chapters give general practitioners training in rheumatic disease.

The most important task of the national headquarters is organizing a program of basic research in the sciences related to rheumatic disease so as to find the causes, better means of diagnosis, improved methods of care. By means of the press, the radio and publications, the national office spreads through the Chapters information on arthritis for doctors and the general public, in order to prevent the disease and encourage early treatment.

GENERAL PRACTICE CLINICS

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medicine

48. *Functional Distrubances of the Duodenum in the Dystonic States of the Biliary Ducts. (Les perturbations fonctionnelles du duodénum dans les états dystoniques des voies biliares.)* P. MALLET-GUY, P. BLONDET AND J. NEFUSSY, Lyons, France. Presse méd. 59:568-570, April 25, 1951.

A radiologic study of the duodenum as it is seen in the course of dystonia of the biliary ducts has enabled the authors to individualize two different types of functional disturbances:

(1) In *hypertonia* the passage of the opaque meal is accelerated; the appearance of the duodenum suggests the presence of increased muscular contractility. The bulb is generally small and contracted with jagged borders, suggestive of an ulcerous bulb; the mucosa of the duodenal loop is suggestive of a so-called "duodenitis." Other characteristics are numerous big deep folds, so close to each other as to be confused into an opaque homogenous coating with jagged borders (appearance of a closed accordion), constant but generally narrowed duodenal lumen, peristaltism and anti-peristaltism of abnormal intensity.

(2) In *hypotonia* the passage is slackened, the prevailing appearance is that of a muscular distension: the bulb generally big, with borders well outlined. The duodenal loop with a lumen generally increasing downwards to portion D^3, where appears a stasis with dilatation, and mucosa with big sinuous folds, distant from each other, outlining large areas with no relief and giving the appearance of a mucosa unfolded like an open accordion are also present.

Both schematic types, although not definitely established, may be considered to be an aid to the diagnosis in the field of "stasis gall-bladder," concerning the meaning of a dystonia state, which is not generally provided by cholecystography. Such functional changes in the duodenum account for a few elements of the syndrome. 1 reference. 6 figures.—*Author's abstract.*

49. *Quantitive Determination of the Visceral Pain Threshold in Man.* EDWARD A. GAENSSLER, Boston, Mass. J. Clin. Investigation *30*:406-20, April 1951.

A quantitative method for measuring visceral pain thresholds by hydrostatic distention of the biliary ducts was described. The initial pain threshold in different patients varied from 90 to 800 mm. of water. A slow rise of pain threshold was often noted in the same patients studied repeatedly from 14 days to seven months after operation.

However, all measurements of pain thresholds of the same patients on the same day were found to be at least within ± ten per cent of their respective average values. In six patients studied at intervals during the course of 12 hours, the control threshold values showed a standard deviation of ± 5.1 to ± 12.6 mm. and a coefficient of variation of 0.67 to 3.82 per cent. The administration of analgesic substances, with the exception of acetylsalicylic acid, invariably resulted in an elevation of the visceral pain threshold. The onset of action, shown by an elevation of the intrabiliary hydrostatic pressure tolerated without pain, was noted between seven and 15 minutes after injection with all drugs studied. The peak threshold elevation was found 30 minutes after administration of morphine and meperidine and 60 minutes after all other agents. The mean peak threshold elevations in per cent together with the number of studies for each drug were as follows: morphine: 40 studies, 56 per cent; codeine: 27 studies, 12 per cent; dihydromorphinone: 11 studies, 42 per cent; methyldihydromorphinone: 7 studies, 46 per cent; methadone: 10 studies, 33 per cent; meperidine: 50 studies, 23 per cent; and acetylsalicylic acid: 13 studies, no threshold elevation. The duration of action was five hours for morphine, four hours for codeine, dihydromorphinone and methyldihydromorphinone, six hours for methadone and three hours for meperidine. When morphine and meperidine were given in increasing doses, the total analgesic action increased in proportion to the dose up to 16 mg. for morphine and 100 mg. for meperidine. A further doubling of the dose to 32 and 200 mg., respectively, caused only a 23 and 37 per cent respective increase in the total analgesic action.

The analgesic effect of various drugs was found to be inversely proportional to the initial pain threshold both in different patients and in the same patients studied at intervals. Parenteral injections of placebos in eight patients were not reflected by a rise in the visceral pain threshold. Differences between visceral and integumental pain threshold responses to the various drugs were noted. The peak threshold-raising action for visceral pain occurred earlier than for superficial pain; the duration of action was shorter, and the intensity of the analgesia was somewhat smaller for visceral pain. In the doses used, morphine showed the most powerful threshold-raising activity and methadone showed the longest action. In contrast to integumental pain, acetylsalicylic acid had no analgesic activity for visceral pain. 32 references. 9 figures. 5 tables.—*Author's abstract.*

50. *The Plasma Cells of the Bone Marrow in Normal and Pathologic Man.* (*Le Plasmacelluls Nel Midollo Osseo Dell'Uomo Nella Norma E Nella Patologia.*) CARLO SACCHETTI, Milano, Italy. Archivio Fondato da Adolfo Ferrata. 35:13-52, fas. 1.

The author has studied the behavior of the plasmacells of the bone marrow in various diseases, considering in comparison to the normal, the modifications of their number and dimension, and those modifications related to the nucleocitoplasmatic growth.

Research has been performed in the following diseases: gastric carcinoma, sepsis from streptococcus viridans, diphtheric angina, during the disease and after recovery, cirrhosis of the liver postnephritic nephrosis, and, as a control, in the normal.

In the septicemia a significant increase of the citoplasmatic diameters has been found, and a disharmony of the nucleo citoplasmatic growth has been evidenced. In the diphtheric angina, during the course of the disease, the cellular and citoplasmatic diameters have shown a significant increase. After the recovery from diphtheric angina, all the diameters (nuclear, cellular, and citoplasmatic) have shown diameters inferior to those seen during the disease. In the cirrhosis of the liver an increase of the percentual values. In the postnephritic nephrosis, a significant difference in respect to the normal was found only for the citoplasmatic diameters. 29 tables.—*Author's abstract.*

51. *The Present Position Regarding Leukemia.* SIR L. WHITBY, Cambridge, Eng. West J. Surg. 59:178-187, April 1951.

Leukemia resembles malignant disease in having an inevitably fatal prognosis and by reason of the associated anemia and cachexia as well as the uncontrollable cell proliferation. On the other hand, there are features of leukemia which do not occur in orthodox malignant disease including spontaneous remissions, remission after simple blood transfusion or simple infection, the noninvasive character of the widespread secondary infiltrations which have a specific and highly selective distribution in the liver according to the type of leukemia, and especially, the fact that leukemic cells mature *in vitro* to normal cells and at a normal rate and at the same time preserve their inherent power to differentiate.

Implantation experiments in the skin, spontaneous and treatment remissions, as well as the effects of certain drugs suggest that leukemia arises from an environmental alteration brought about by some metabolic defect, of which indications are to be found in detectable alterations in purine metabolism, folic acid metabolism, and the distribution of trace elements.

If this be so, then the treatment of leukemia with antimitotic remedies such as x-rays, radioactive isotopes, colchicine, and nitrogen mustards is irrational and attention should turn to studying the physiology of normal leucopoiesis including the factors which control leucocytic division and leucocytic release into the circulation. Such studies should provide a logical and rational approach to therapy. 12 references.—*Author's abstract.*

52. *Haemophilia Associated with Normal Coagulation Time.* C. MERSKEY, Oxford, England. Brit. M.J. *4712*:906-912, April 28, 1951.

During an examination of a large series of hemophilic patients, a number were found in whom the coagulation time was constantly normal or near normal. This paper describes the clinical features and laboratory findings in these cases. The inheritance was the classical inheritance of hemophilia. The clinical picture was also that of haemophilia, but generally tended to be milder especially with regard to haemarthroses and resultant crippling ankylosis of joints. The hemorrhagic episodes were more widely spaced and often less severe than those of classical hemophilia. Exceptions however occurred and in some cases a severe clinical syndrome resulted. The normal coagulation time was a constant feature and was not a fluctuation of a prolonged coagu-

lation time to normal. There was defective consumption of prothrombin during coagulation if the test was done on venous blood, but not if capillary blood was used. Even on venous blood the defect was less marked than in the usual type of hemophilia. The blood of these patients could not correct the coagulation defects of hemophilic blood to the same extent that normal blood could. They appeared to have the same coagulation defect but in lesser degree. Possibly they had less (available) "antihemophilic globulin." The danger of relying on a normal coagulation time to exclude a diagnosis of hemophilia is emphasized. Surgery might be safer in this variety of hemophilia than in the variety with prolonged coagulation time, but even so the risk of hemorrhage is formidable. The various members and generations of the same families all seemed to have the same variety of hemophilia. The syndrome thus appeared to breed true. 19 references. 11 figures. 1 table.—*Author's abstract.*

53. *A New Diluting Fluid for the Eosinophil Count.* T. MANNER, M.B., B.S., Sunderland, England. Brit. Med. J. 1429-30, June 1951.

A diluent for the eosinophil count is described. The formula is:

Urea	50 Gm.
Trisod. citrate	0.6 Gm.
Distilled water	to 100 ml.
Aqueous phloxine 2 per cent	5 ml.

This fluid destroys erythrocytes and the majority of leucocytes. Eosinophils are preserved and stain pink. In this diluent, blood may be left in the mixing pipette for half an hour, and then remixed to fill the counting chambers. This treatment does not destroy eosinophils, as in the case of Dunger's diluent. Five cases are given to illustrate this point.

The fluid is less viscous than propylene glycol diluents, and owing to its high urea content, it evaporates slowly. 6 references. 1 table.—*Author's abstract.*

54. *Uses and Abuses of Antihistamine Drugs.* W. BOWEN SHERMAN, New York, N. Y. Bull. New York Acad. Med. *27*:309-24, May 1951.

The available antihistaminic drugs are all essentially similar in their action and side effects although varying both in potency and toxicity. No one drug may be said to be the best. These drugs are of value for symptomatic relief in allergic rhinitis, urticaria, and serum sickness and for the control of itching. In no disease do they have a curative effect. In asthma, their efficacy is less than that of older drugs. In the treatment of the common cold, they do not alter the course of the infection but may afford some symptomatic relief. The commoner side effects are drowsiness and nausea. Long-continued use occasionally leads to leukopenia or agranulocytosis. Contact dermatitis not infrequently results from their topical use. On the whole, these drugs represent a definite contribution to therapy, but there is still room for newer compounds with greater potency and less toxic effects. In most of the allergic diseases, their efficacy is surpassed by that of cortisone and ACTH. 25 references. 4 figures.—*Author's abstract.*

55. *The Later Development of Debilitated and Premature Infants. (L'avenir lointain des débiles et des prématurés.)* JENE LEVESQUE AND R. COFFIN, Paris, Bull. Acad. nat. méd. *135*:228-32, April 10, 1951.

The authors report a follow-up study of 95 premature infants who had been hospitalized for prolonged periods at the Salpètrière and 148 children with a history of prematurity and debility at birth who had not been hospitalized after a delivery; a supplementary study was made at a psychiatric clinic of 157 children with a history of prematurity. In the first group of 95 children, physical development was fairly satisfactory; they obtained their normal weight at about four years of age and their normal height at about three years of age. But 46 of these 95 children showed some abnormality of behavior. Anorexia was a common symptom, being persistent in 47 children, 36 of whom weighed less than 2 Kg. at birth. Enuresis persisted after the second year of life in 44 children. The intellectual development was studied by the Binet-Simon tests and by the school records. Only 4 of these children showed a superior intelligence, 20 an average intelligence, 25 retardation in school of one year, 8 retardation in school of more than two years; 3 were imbeciles or idiots. In this group it was noted that those who were hospitalized for the most prolonged periods showed the greatest degree of retardation and mental deficiency. In the group of 148 children who had been living at home, their weight at birth was somewhat higher than in the preceding group. They had attained their normal weight and height at approximately the same time as the first group. The incidence of behavior abnormalities and anorexia was about the same in both groups. The mental development, however, was definitely superior in this group as compared with the first group. Of these 148 children, 9 showed a superior intelligence, 82 a normal mental development, 34 a retardation of one year at school; 9 showed a retardation of more than two years, and 2 were idiots. In the study of the 157 children at the psychiatric clinic, instability, anorexia, and behavior abnormalities were found in 42 children with an average birth weight of 2.5 Kg.; 34 with an average birth weight of 1.8 Kg. showed a mental retardation of one or two years; and 32 of the same birth weight showed a mental retardation of two to five years. There were 1.8 cases of mental retardation of two to five years. There were 18 cases of mental retardation associated with convulsions, mongolism, etc., and 31 cases of nervous diseases, encephalopathy, etc. These findings indicate that prematurity plays the most important role in mental retardation, behavior difficulties, and psychomotor disturbances observed in children born prematurely; but that the prognosis can be improved by bringing up these children in a normal family environment without prolonged periods of hospitalization.

56. *Poisoning with Acetylsalicylic Acid Given Therapeutically to Infants and Children.* T. IVERSEN AND E. SCHIODT, Denmark, Ugeskr. Laeger, *113*:443-55, April 12, 1951.

Four cases of acetylsalicylic acid poisoning in children are reported. Two cases had simple poisoning while the other two also had bronchopneumonia.

(1) A boy aged 2 years received 18 Gm. during 14 days.

(2) A boy aged 7 months received 1¾ Gm. during 1 day.

(3) A boy aged 2 years received 6-7 Gm. during 6-7 days.

(4) A girl aged 6 months received 3 Gm. during 3 days; died.

The literature on acetylsalicylic poisoning in children is reviewed. It is pointed out that the drug is more toxic to sick children and that the diagnosis may be difficult in these cases. The symptoms and signs are described from the study of 39 cases reported in the literature and from the authors' own 4 cases. The main symptom is hyperpnea; in addition, the child is often dehydrated and may be apathetic or delirious. In severe cases, coma and shock dominate the picture. The disturbance of the acid base balance and the changes in the electrocardiogram, of which the prolongation of the systole is the most notable, are discussed. The clinical picture may resemble pneumonia, myocarditis, sepsis, and diseases causing acidosis.

For treatment 0.9 per cent sodium chloride and 5 per cent glucose, given subcutaneously, to combat the dehydration and ketosis is recommended. In addition, 1.3 per cent sodium bicarbonate given subcutaneously or intramuscularly is recommended for all cases in order to correct the acid base balance and to increase the excretion of salicylate, though the dose must be small in order to avoid alkalosis.

Finally, it is concluded that acetylsalicylic acid ought not to be given during the first years of life and must never be given if the child has pneumonia.

57. *Anoxemia and Hippocratic Finger.* (*Anoxémie et hippocratisme digital.*) P. P. LEVY, Paris, France. Presse méd. 59:490-93, April 11, 1951.

It was once believed that hippocratic finger was the distinguishing feature of tuberculosis, but it is recognized today that the complete deformation with end swelling similar to a drumstick is rarely encountered in pure pulmonary tuberculosis. On the contrary it is almost always present in major pulmonary and pleural suppurations.

Apart from cases where a mechanical factor is obvious (vascular pressure, stasis), a pulmonary or extra-pulmonary infection, a visceral or septicemic infection is to be found.

The writer thinks that, whatever the initial cause, hippocratic finger is dependent upon tissular anoxia which is connected to anoxemia.

Two types should be considered:

1) Cases of mere mechanical origin, *where the red cell is safe* (cardiac cyanosis): very low oxyhemoglobin saturation, but response of the blood to the oxygen inhalation test.

2) Cases of toxemic origin, *with involvement of the red cell:* less low oxyhemoglobin saturation, but no response of the blood to oxygen inhalation test.

In pure pulmonary tuberculosis there is practically no hippocratic finger because Koch's bacillus, in contrast to pyogenic bacteria, exerts no reducible action on the blood as experimentally demonstrated *in vitro* and *in vivo*.

The writer observes that this concept of the pathogenesis of hippocratic finger includes in the same determinant agent (anoxemia) the two main causes, apparently incompatible, formerly considered: *disturbances in hematosis* by defect in the container, that is the vessel, and *toxi-infection* which disturbs the hematosis by deterioration of the contents, that is deficiency of the red cell.

dermatology

58. *Aureomycin Ointment in Dermatology. (La pommade à l'auréomycine en dermatologie.)* GEORGES GARNIER, Paris. Presse méd. 59:542-43, April 21, 1951.

The author reports the use of aureomycin ointment in the treatment of various dermatological infections; in the preparation of the ointment, either pure vaseline or carbowax is employed with 3 per cent aureomycin. This ointment has proved of special value in the treatment of epidermitis occurring around leg ulcers or infected wounds; the application of the aureomycin ointment, after cleansing and bathing with permanganate, results in the rapid healing of such skin infections. In some cases of severely infected leg ulcers, the use of the aureomycin ointment has also resulted in healing. The aureomycin ointment is also effective in intertrigo with bacterial infection, especially in intertrigo involving the inguinal and retroauricular regions, which is so often resistant to the usual methods of treatment. Folliculitis due to staphylococcus infection, especially in the hairy regions of the body (beard, pubis, etc.), is one of the chief indications for the use of the aureomycin ointment; healing is more rapid than with any other method of treatment employed, even in the more chronic cases. Even sycosis (the chronic form of folliculitis of the beard and mustache), although of years' duration, responds to treatment with aureomycin. In some cases of sycosis, the ointment is applied to the lesions every day at first, later three times a week. Many cases of streptococcal impetigo heal with the usual topical applications, but in the more severe cases, where such treatment is ineffective, aureomycin ointment is indicated. In 70 cases treated with the aureomycin ointment, the author has observed only one case of slight local irritation resulting from the application of the ointment (in this case vaseline ointment); and this reaction was not sufficiently severe to make it necessary to discontinue treatment before the folliculitis was cured. In all other cases the ointment caused no reaction. 2 references.

59. *Dangers of External Application of Penicillin. (Dangers de la pénicilline en usage externe.)* A. TZANCK, E. SIDI, AND J. GAUTARD, Hôpital Saint-Louis, Paris. Presse méd. 59:713-14, May 23, 1951.

In 22 months, 32 cases of reaction to local applications of penicillin occurred, representing 14.8 per cent of all cases of *dermatitis medicamentosa* seen during that period. Seven illustrative cases are reported in which the reaction was of varying degrees of severity. In some cases the reaction resulted from repeated local applications, and sometimes from injection of penicillin after local treatment had been completed. Reactions followed the use of penicillin ointment more frequently than other forms of local application, probably because of the greater penetration of ointment into the tissues. The epidermal sensitivity to penicillin resulting from local applications may also involve the development of a generalized sensitivity. As the skin infections for which local applications of penicillin are usually employed are rarely of a serious nature, such local applications should be used with caution, as they may involve a penicillin-sensitivity that would contraindicate the use of penicillin in a more serious general infection. 3 figures.

60. *Kaposi's Varicelliform Eruption: Record of an Outbreak.* J. SOMMERVILLE, W. NAPIER, AND A. DICK, London, England. Brit. J. Derm. *63*:203-14, June 1951.

An outbreak of K.V.E. is recorded with one death. The case histories are incorporated. There are eight plates included in the article, five in color and one of a 72-hour culture of the vaccinia virus on chorio-allantoic membrane. Three temperature charts are also shown, two of which reveal a distinct response to aureomycin therapy. Bacteriological findings revealed staphylococcus pyogenes, coagulase positive, Gram-negative cocci, and B-hemolytic streptococci. The technique used in the virological investigations is fully described with the results. An obvious association with recently vaccinated subjects was invariably found. *Dermatitis gangrenosa infantum* was noted as a complication of one case. In discussion, the mode of infection and the differential diagnosis from small pox are suggested and outlined. Varying degrees of severity were encountered. In view of the danger of infection occurring in an unvaccinated sufferer from eczema, it is suggested that in the event of the need for widespread vaccination such patients should be discharged from skin wards and treated for the time being at home. 11 references. 7 figures. 3 tables.—*Author's abstract.*

61. *Sunburn Prevention: A Vanishing Cream Effectively Opaque to Actinic Rays.* WILLIAM J. HEMPHILL, Eugene, Oregon. Northwest Med. *50*:424-25, June 1951.

In an attempt to inhibit sunburn in susceptible persons, a vanishing cream was formulated which contained 1 per cent phenyl salicylate, 5 per cent antipyrine, and 5 per cent sodium para-amino-benzoate. These chemicals were found to have the power to absorb ultra-violet radiation of between 2100 Angstrom units to 3200 Angstrom units. Clinical trials using both a Hanovia lamp and natural sunlight showed that the formula is effective in inhibiting ultra-violet injury to the skin. 7 references.—*Author's abstract.*

62. *Changes in Sweating after Prickly Heat.* W. S. S. LADELL, London, England. British Medical Journal, Brit. Med. Ass. *4719*:1358-60, June 16, 1951.

Serial routine tests carried out on a European after his arrival for the first time in the tropics showed that he became less instead of more acclimatized to heat after six months in the tropics, during which time he had been moderately active. He sweated less, his rectal temperature rose more, and his heat tolerance was diminished in a standard acclimatization test; the chloride content of his sweat was raised. The subject had had severe "prickly heat" and had been complaining of exhaustion and some debility; this, and the changes in the sweating, lead the author to diagnose him as a mild case of Type II Heat Exhaustion, which often followed severe prickly heat. This syndrome is probably the same as Tropical Anidrosis. The diminution in heat tolerance cannot be accounted for by the diminution in sweating, nor, probably, can the changes in the chloride content of the sweat; these, the author suggests, in a deliberately controversial discussion and in subsequent correspondence in the same journal, may be an expression of some central disorder of the nature of what Selye would term a "breakdown of adaptation." The importance of the adrenal cortex in heat tolerance

and in the control of sweating is now generally recognized. The actual breakdown is precipitated by the skin changes following severe prickly heat, or possibly by the prickly heat itself. 18 references. 2 tables.—*Author's abstract.*

63. *Role of the Dermatologist in the Treatment of Skin Lesions in Association with Varicose Veins.* MORRIS H. SAMITZ, Philadelphia, Pa. Urol. & Cutan. Rev. 55: 353-54, June 1951.

There are many skin lesions which closely resemble those cutaneous eruptions which often complicate varicose veins but which can be produced by different mechanisms. These skin diseases localized to the lower extremities, which may be mistaken for the cutaneous manisfestations of peripheral-vascular disease, can be classified for differential diagnosis according to three causal mechanisms: (1) external; (2) systemic; and (3) exclusive dermatological entities of known or unknown origin.

Emphasis is stressed on establishing an etiologic diagnosis. This is accomplished by integrating the complete physical examination of the patient with the history, the attributes and distribution of the cutaneous lesions, and with the aid of the laboratory.

A simplified classification of cutaneous eruptions observed in association with varicose veins is presented:

(1) The primary eruptions are listed as (a) stasis dermatitis, (b) varicose eczema, and (c) varicose ulcer. Associated with these primary entities are their sequelae: (a) hyperpigmentation, (b) localized neurodermatitis, and (c) dermatosclerosis.

(2) The secondary eruptions are superimposed or complicate the primary eruptions: (a) fungous infections, (b) pyogenic infections, and (c) allergic eczematous contact-type dermatitis.

The proper approach in the treatment of the cutaneous disorders in association with varicose veins is a program coordinating and utilizing the facilities of the dermatology, the peripheral-vascular, and the surgery departments. The dermatologist can best differentiate and eliminate those cutaneous diseases of the lower extremities that simulate the cutaneous manifestations, which reflect an underlying peripheral-vascular disorder. To attain maximum benefit for the patient with skin diseases associated with varicose veins, proper dermatologic management will afford symptomatic relief for those patients in whom a conservative regimen is advisable and will insure best preparation of the skin if surgery is indicated.—*Author's abstract.*

64. *Acne Vulgaris. A. Psychosomatic Study.* E. WITTKOWER, Allan Memorial Institute, Montreal, Canada. Brit. J. Derm. 63:214-23, June 1951.

Sixty-four patients suffering from *acne vulgaris*, 31 men and 33 women, were submitted to a personality study. All the patients studied were at least 18 years of age, most of them over 20.

According to their prevailing characteristics, the patients could be classed as: (1) rigid personalities, (2) rebels and dreamers, (3) overgrown children, (4) sufferers from gross psychological disorders. A majority of the 26 patients labeled as rigid per-

sonalities had grown up against a repressive background. As grown-ups, almost without exception, they displayed an exemplary behavior. Factors which distinguish these patients from many other persons are the harshness of their conscience, their frantic efforts to control their instinctual impulses, and the unusual severity of their self-reproaches and self-condemnation if in thought, phantasy, or action they had trespassed upon their self-imposed prohibitions. They were not only straightlaced, but had placed themselves voluntarily and almost deliberately in a straightjacket as if they needed one to keep themselves in check. As is common at puberty, the 14 patients described as rebels and dreamers were boastful, flouted authority and convention, were dirty and untidy or were subject to feelings of unworthiness, decried the depraved state of the world and had world reformatory ideas. Female patients prevailed at a ratio of 6 to 1 among the 7 "overgrown children." As implied by the term, they were arrested or retarded in their development or had fallen back to childhood behavior after feeble attempts at asserting themselves. They behaved like anxious little schoolgirls, rather than as grown-up women. Eight patients suffered from gross psychological disorders: anxiety hysteria (four cases), conversion hysteria (two cases), endogenous depression, character disorder, psychopathic personality (one case each). Nine patients could not be classed in any of the groups described.

Irrespective of their prevailing characteristics, a feature common to a majority of the acne patients studied was an inhibition of their sexuality. Sexual inhibition and employment of reaction formations against sexual impulses were particularly marked in the largest group of this series, the rigid personalities. An indication of the correctness of the statement that patients suffering from acne are sexually inhibited may be obtained from the facts that out of the 10 married women in this series, seven showed evidence of gross sexual maladjustment (in contrast with 1 in 20 primiparae) and that out of the 16 men who had had sexual experiences, 3 were either impotent or labile in their potency.

The behavior of the patients studied resembles in many respects that of boys and girls at puberty. Because patients under 18 were excluded from this series and because many of them were in their twenties if not older, it appears that the patients studied were arrested in their emotional and psychosexual development at the stage of puberty. There is no evidence that there was a corresponding delay in physical development. No claim is made that *acne vulgaris* can be explained on psychological grounds alone. But the hypothesis is submitted that not only the physiological process of maturation but also the emotional disturbances connected with puberty are relevant to its common onset at this period of life; and that a retardation of emotional and psychosexual development is related to its onset or persistence beyond the span of life usually allotted to puberty.

65. *Herpes Zoster Appearing During Cortisone Therapy: Case Report.* HAROLD C. FISHMAN, Beverly Hills, Calif. Ann. W. Med. Surg. 5:487, May 1951.

Herpes zoster appeared on the right shoulder and arm of a thirty-five year old white woman with rheumatoid arthritis, who had been under constant cortisone therapy for

eight months. It appears that cortisone will not protect against virus diseases like *herpes zoster*. Cortisone therapy did not prevent the pain associated with *herpes zoster*. Cortisone therapy did hasten the involution of *herpes zoster* skin lesions.

otorhinolaryngology

66. *Cases of Serous Mucous Cysts of the Nasal Vestibule* (*Le Cisti Siers-Mucosa del Vestibulo Nasale*). R. SCUDERI, Como, Italy. Arch. Ital. di otal. *62*:340-54, August 1951.

Five cases of serous mucous cysts of the nasal vestibule are described. On the basis of clinical and histological observations regarding these cases, the investigator is of the opinion that Klestadt's thesis, modified according to Citelli and Giuffrida (development deriving from ectodermic embryonic inclusions in the joining of the upper jaw process with the nasal processes), is the most reliable among the various pathogenetic theories regarding these cysts. 45 references. 5 figures.

67. *Observations on Abductor Paralysis of the Vocal Cords*. A. F. WILLIAMS, London, England. J. Laryng. & Otol. *65*:397-403, June 1951.

Since Semon popularized the belief that the abductor function is the one to be affected first in recurrent laryngeal nerve lesions, there has been a dispute about the explanation and validity of the law. A patient who was first thought to be suffering from a bilateral abductor paralysis after thyroidectomy proved to have no organic nerve lesion. This incident led to the present investigation.

If the abductor fibers in the recurrent nerve are more susceptible than the adductors to trauma, then they should also be more susceptible to stimulation. The recurrent nerve was stimulated at operation but minimal stimulation always produced adduction of the corresponding cord. It was thought that stimulation affected both adductor and abductor fibers; but the former muscles being more powerful, adduction was the movement which resulted.

If a recurrent nerve is divided, the only abductor muscle of the cord is paralyzed, but it is still possible for some adduction of the cord to occur by the action of the unparalyzed half of the inter-aryteroideus and the cricothyroid.

It is suggested that Semon's law is explained not by any peculiar vulnerability of the abductor fibers in the recurrent nerve but by the muscular actions, already outlined. 7 references.—*Author's abstract.*

68. *The Nerve Supply of the Laryngeal Muscles*. A. F. WILLIAMS, London, England. J. Laryng. & Otol. *65*:343-48, May 1951.

The nerve supply of the laryngeal muscles has been studied by the dissection of 30 larynges, the serial section of six blocks of tissue containing nerves entering

muscle, and by electrical stimulation of the internal laryngeal nerve in two patients at operation.

It was found that the recurrent nerve constantly divides, outside the larynx, into motor and sensory branches. The motor branch contained abductor and adductor fibers, and in not 1 case was there found an extralaryngeal separation of the abductor and adductor components into separate trunks.

The superior laryngeal nerve constantly sent branches into the inter-arytenoideus muscle. Some of these traversed the muscle to enter the mucosa on its deep surface, but some seemed to end in the muscle. Serial sections showed that fibers from these nerves seemed to end near muscle fibers; but stimulation of the internal laryngeal nerve in two patients at operation failed to produce evident movement of the vocal cords. It was, therefore, thought that the superior laryngeal nerve probably supplied proprioceptive fibers to the inter-arytenoideus muscle.

There seemed to be no communication between the nerves of the two sides of the larynx. 10 references. 5 figures.—*Author's abstract.*

69. *Tuberculous Bronchostenosis.* PAUL W. GEBAUER, Honolulu, Hawaii. Hawaii M. J. *10*:423-28, July-Aug. 1951.

This article is based on a study of 95 surgical specimens in which an incidence of endobronchial tuberculosis was encountered in over 60 per cent of cases. The types of tuberculosis in small branch bronchi are described, and the frequency of involvement of small bronchi adjacent to small localized lesions was regarded as much more significant than the low incidence of endobronchial tuberculosis encountered in routine sanatorium admissions. The frequency of destroyed and involved cartilages with subsequent collapse of the bronchus was noted as an important contributory factor to the formation of stenosis.

The implications of bronchostenosis were exemplified by a case report of severe stenosis involving the right upper and right main bronchi with complete destruction of the upper lobe and insignificant damage to the right lower and middle lobes. Patient was treated by upper lobectomy and correction of the stenosed main bronchus with a dermal graft. The alterations in the pulmonary arterial circulation and in the arterial bronchial circulation secondary to destructive lung lesions are commented on. 11 references. 5 figures.—*Author's abstract.*

70. *The Factor of "Age" in Indications for Tonsillectomy (Le facteur "age" dans l'indication de l'amygdalectomie).* PEDRO FALCAO, Sao Paulo, Brazil. Ann. otolaryng. *68*:374-79, No. 5-6, 1951.

Since adopting a method of intracapsular removal of the tonsils in 1933, the author has performed 2,244 tonsillectomies on patients from 12 months to 75 years of age. In the 2 patients over 70, the results of the operation were excellent. In 1 case a chronic ititis cleared up after the tonsillectomy, and in the other case a chronic irido-cyctitis following an operation for cataract completely subsided. Age

has not been found to be an important factor in determining the results of tonsillectomy. The technic of the operation and pre- and postoperative care are of much greater importance. It has been observed, however, that in children up to 3 or 4 years of age, the presence of chronic infection of the tonsils, with occasional acute attacks of tonsillitis, does not necessarily cause serious symptoms or interfere with the child's general development.

The acute attacks can be successfully treated with antibiotics, and the chronic infection is usually controlled with a calcium and bismuth mixture without ill effects on the general health. When this is the case, the author prefers to delay operation until the age of 3 to 5 years, at which time a tonsillar infection becomes a more definite danger to the child's health and normal development. Operation should be performed on younger children, however, when definitely indicated by respiratory difficulties or danger of a generalized infection. In the series reported, 46 tonsillectomies were performed on children 1 to 3 years of age, 130 tonsillectomies on children 3 to 5 years of age, and 406 operations on children 5 to 10 years of age. 1 table.

71. *The treatment of Epitheliomas of the Tonsil* (*A propos du traitement des épithéliomas de l'amygdale*). N. CARREGA AND G. A. BREMOND, Marseilles, France. Ann. d'oto-laryng. *68*:161-67, No. 2-3, 1951.

The author reports the treatment of epithelioma of the tonsil by the local application of radium, either in the form of needles or by means of a special intra-oral applicator. When the glands are involved, as is frequently the case, the authors prefer surgical removal of these glands, followed if necessary by x-ray therapy. In cases in which the glands cannot be removed surgically, telecurietherapy or x-ray therapy is employed. In cases of epithelioma of the tonsil treated with radium, the local lesion was healed as a rule, ulcerative lesions taking longer to heal than nonulcerative lesions. The best results were obtained with the application of radium with the special applicator, but in some cases radium needles were also used if the growth was extending toward the border of the tongue.

In 56 cases treated at an anticancer center with radium, only five cures of five or more years' duration were obtained. However, for many of these cases the special intra-oral applicator was not available. This applicator was used in 12 patients, and 4 of these patients were cured for five years or more; the fifth patient with a five year cure was treated with radium needles. In private practice, better results are obtained. Of 7 patients treated with the special applicator, 2 have died from glandular metastases without showing any recurrence of the local growth. One patient shows a growth in the parotid and subretromandibular region, but no local recurrence; this patient is still living over three years since the treatment of the primary lesion was completed. Four patients are living without signs of recurrence or glandular involvement; 3 of them for more than five years.

The better results in this group than in the hospital group are attributed to: the use of the special applicator for treatment in all cases, the fact that the patients

were seen earlier and could be more carefully followed up, the fact that the general condition was better because the progress of the growth had not interfered with nutrition or caused toxemia.

72. *Problems of the Septum in Rhinoplastic Surgery*. OSCAR J. BECKER, Chicago, Ill. A. M. A. Arch. Otolaryng. 53:622-39, June 1951.

The embryology and anatomy of the septum are discussed. Septal deformities are classified as: (1) developmental, with deviation of the entire bony and cartilaginous septum due to growth pressure or trauma before the age of six; and (2) traumatic, which differs from the first in that the cartilage is dislocated from the vomerian maxillary crest groove. Traumatic deformities are further subclassified as lateral, with lateral dislocation of the septal cartilage; depressed, from a frontal blow with buckling, hoisting, fibrosis, and reduplication of the septal cartilage; and latero-frontal, which is a combination of the first two.

In the repair of septal deformities, a rhinoplastic approach is used, with transfixion of the membranous septum. A mucosal flap is then elevated from the convex side. The remaining procedure is individualized to the type of pathology.

Developmental type: The maxillary spine and crest and the vomer are infractured by chiseling through them at the floor of the nose. Then the septum is shifted to the mid-line as a unit without disturbing the ostrocartilaginous junction. The deflection is corrected by breaking the spring with vertical incisions, removal of sections, or cross-hatching. This should extend through the maxillary spine and crest and the vomer. The posterior septum is corrected, if necessary, by the classic submucous resection. Deviation of the nasal dorsum affecting the septum is corrected by fracture of the maxillary and nasal bones and, if necessary, by cutting the upper lateral cartilages from the septum. If a complete severence is done, the mucosa should be left intact. Sometimes lateral freeing is sufficient. A mucosal graft from a redundant septum or the upper lateral cartilage is used to cover the raw area on the nasal floor. The nose is packed with wax and vaseline gauze.

The factors which cause this modification to succeed where the Metzenbaum frequently failed are discussed.

Lateral traumatic type: In addition to the above procedure, it is necessary to replace the cartilage in the vomerian groove.

Depressed type: A more or less complete septum resection is necessary. The nasal dorsum is protected by a dorsal and columellar cartilaginous implant and by not cutting the upper laterals from the septum.

Latero-frontal: This is frequently handled like a lateral type. Often, however, an extensive septal resection is necessary. If this is done, a strip of subdorsal septal cartilage is left, except in unusual cases where there are extremely strong upper and lower lateral cartilages to protect the nasal dorsum. A columellar graft is always used. Frequently only a limited rhinoplasty is possible as the upper laterals cannot be cut from the septum (lateral freeing may suffice).

The author's main emphasis is that, except in a few cases (in the depressed type and an occasional latero-frontal type), wide resection of the septum is unnecessary and therefore inadvisable. In most cases, the septum can be manipulated into place and preserved as a stabilizing agent. 15 references.—*Author's abstract.*

73. *The Effects of Adenoidotonsillectomy in Respiratory Allergies* (*Les effets de l'adénotonsillectomie dans les allergies respiratoires*). D. GORELIK, Alexandria, Egypt. Ann. d'oto-laryng. *68*:46-59, No. 1, 1951.

The author reports a follow-up study of 93 patients after adenoidectomy, tonsillectomy, or adenoidotonsillectomy in relation to the effects of the operation on allergic symptoms. In 11 patients, all adults, tonsillectomy alone had been performed; in 72 patients, all children, adenoidotonsillectomy had been performed; and in 10 patients, all children, adenoidectomy alone.

The follow-up study showed that the operation had not had any favorable effects in patients with asthma or vasomotor rhinitis. In fact, symptoms had been aggravated in 16 cases of allergic rhinitis. In 18 cases symptoms of vasomotor rhinitis developed, after operation, in patients who had not previously shown any symptoms of allergy. In 7 patients (all adults) a seasonal tracheal cough developed after operation. A recurrence of growth of lymphoid tissue in the nasopharynx is not uncommon in allergic patients. In such cases Crowe's method of radiation therapy would seem to be of value. 36 references.

74. *Trotter's Syndrome and Associated Lesions.* N. ASHERSON, London, Eng. J. Laryng. and Otol. *65*:349-66, May 1951.

A characteristic syndrome is produced by a neoplastic lesion arising and infiltrating on the base of the skull, deep to the lateral wall of the nasopharynx, but without encroaching on its lumen (Trotter 1910). The sequence of symptoms is deafness, followed by pain and anesthesia of the mandibular nerve and assymetry of the palate and later trismus from infiltration of the internal pterygoid muscle and cervical metastases. The lesion was a primary endothelioma.

Pin-pointing the lesion of Trotter's syndrome to the region of the Sinus of Morgagni, the writer distinguishes another allied syndrome. This is the pterygopalatine fossa syndrome in which there first develops pain and anesthesia in the maxillary nerve; deafness, later; pain and anesthesia of the mandibular nerve; blindness; sixth nerve palsy with motor paralysis of the pterygoid muscle. Such a case is described, arising from a metastatic deposit in the pterygopalatine fossa secondary to an anaplastic carcinoma of the breast.

The anatomy of these two adjacent inter-related regions at the base of the skull is detailed. Statistics of the incidence are discussed, especially its low incidence—relation to other malignant diseases of the upper jaw.

The tumor spreads along the base of the skull, obliterating foramina and invading them to reach the interior of the skull. In this way the mass extends laterally

to the temporal fossa; inferiorly along the posterior border of the alveolus to reach the hard palate; intracranially through the foramina; it does not go into the lumen of the nasopharynx; cervical lymph nodes occur. The severity of the pain is characteristic. Treatment by radiation is advised.

Jacod has also described the same symptoms arising from an intracranial mass in the middle cranial fossa.

surgery

75. *Physiologic Basis for the Choice of Anesthesia.* FRANCIS F. FOLDES, Pittsburgh, Pa. Pennsylvania M. J. *54*:537-40, June 1951.

The properly selected anesthesia has to be safe with regard to mortality and morbidity; it has to ensure optimal operating conditions, and, as far as it does not conflict with the first two requirements, it should be pleasant for the patient. The pharmacological properties of the anesthetic agent chosen should not increase the pathophysiological and biochemical changes present preoperatively or expected to develop in the course of surgery. The choice of anesthesia will be influenced by various physiological and pathological factors. Of the former, age, body build, and pregnancy, and of the latter, shock, dehydration, circulatory disease, respiratory disease, metabolic disorders, liver and kidney disease, and neurologic disorders are of paramount importance. The medical anesthetist should have a free hand in the anesthetic management of the patient. His choice should be made after careful study of the patient and consultation with the surgeon. The insistence of either the surgeon or the anesthetist on the use of the same agent and method in all patients will fail to bring optimal results. 3 references.—*Author's abstract.*

76. *Surgical Treatment of Intra-oral Cancer.* H. S. J. WALKER, JR., Mobile, Ala. J.M.A. Alabama *20*:357-66, April 1951.

Intra-oral cancers were first treated by surgical methods. However, the lack of modern supportive therapy led to a prohibitive mortality, so that with the advent of radiotherapy most of them were treated by some method of irradiation. Gradually methods became standardized, but still the gross five year cure rate could not be lowered below the present level of 20-25 per cent. Modern surgery has progressed to the point where the mortality in head and neck procedures is no longer a factor of importance, and the sole criterion for selection of treatment should be the ability to cure. The fields of surgical attack are being widened, and the follow-up of cases to date gives every indication that the long range results from extensive surgery will be better than those obtained by any other methods.

Indications for radiotherapy are poorly differentiated lesions, as lymphomas and anaplastic epidermoid carcinomas, and lesions in inaccessible sites such as the nasopharynx. Indications for surgery are well differentiated lesions, metastatic tumors, bone involvement, postirradiation recurrences, and radio resistant tumors such as ameloblastomas and salivary gland tumors.

The extent that "electrosurgery" is used instead of "cold knife" surgery depends more on the preference of the operator than upon any inherent qualities of the cutting current.

General factors of importance are careful technic, adequate blood, antibiotics, and endotracheal anesthesia.

Preoperative care is similar to that of any major surgical procedure, but the postoperative period is complicated by difficulties with respiration and nutrition. Clear airways must be maintained, and this frequently requires a tracheostomy. Occasionally a patient who has had a very extensive intra-oral resection may benefit by a gastrostomy during the time that it takes him to relearn to swallow.

The three standard neck dissections are suprahyoid, supraomohyoid, and radical. Any of these may be combined with resection of the ipsilateral jaw, in which case it is termed a "jaw-neck dissection." Frequently, portions of the tongue, cheek, or other structures must be removed with the neck dissection "en bloc". The common and internal carotid arteries should be spared whenever possible because their interruption is dangerous.

The tongue, floor of the mouth, and upper and lower gingivae are particularly suited to surgical treatment. The results of extensive surgery in the treatment of cancers occuring in these areas should be superior to other forms of treatment.

77. *Flexion Treatment of Low Back Pain.* WILLIAM L. WALDROP AND HOWARD B. SHORBE, Oklahoma City, Okla. J. Oklahoma M. A. *44*:138-41, April 1951.

Many patients with low back pain, some of whom even have radiation into a hip or leg, are suffering from a type of backache found in lordotic posture. Most of these patients have a severe lordosis, sometimes due to posture, sometimes due to mechanical weakness of the lower spine, but always presenting a relative hyperextension of the sacrum on the lumbar spine or hyperextension of the lower lumbar joints. These patients present a history of sudden onset, gradual onset, or recurrent low back pain, often with radiation. Analysis reveals the fact that hyperextension of the lumbar spine on the sacrum produces the pain, while flexion relieves it. Examination reveals tenderness, pain, and limitation of motion in the low back. Sciatic nerve-stretching tests are frequently positive, but skin sensation and deep reflexes are usually normal. If these latter are abnormal, a diagnosis of herniated disc must be considered. Treatment involving flexion of the pelvis and lower lumbar spine is outlined. This involves rest, the use of a flexed bed similar to Fowler's position, the use of traction at a 45 degree angle to the horizontal applied to the pelvis by means of a circular band. A flexion type cast and flexion type brace are described. Exercises are outlined to

strengthen the abdominal and gluteal muscles and stretch the hamstrings and tight back extensor muscles. Steps are outlined for getting the patient to sit, stand, walk, and sleep in correct position to prevent hyperextension strain. 16 references. 9 figures. —*Author's abstract.*

78. *Cerebral Angiography.* ALFRED UIHLEIN, Rochester, Minn. Proc. Staff Meet. Mayo Clinic *26*:133-39, April 11, 1951.

One hundred cerebral angiograms were made on 77 patients. The dye was injected into the common carotid artery. In 31 patients suspected of having a brain tumor, 16 lesions were identified by cerebral angiography (52 per cent). Seventeen of 36 patients suspected of having a subarachnoid hemorrhage demonstrated a vascular lesion by angiography (47 per cent). In 6 cases, the angiograms did not indicate a brain tumor, the presence of which was later verified. In 2 cases, the angiograms were interpreted as indicating a brain tumor, but the diagnosis could not be verified at operation. Unsatisfactory angiograms were obtained in 10 per cent of the cases owing to technical difficulties. Some of the complications of angiography are presented. An inexpensive but very satisfactory rapid roentgen cassette changer is described.

Cerebral angiography is a safe and helpful diagnostic aid in the localization of intracranial lesions.

79. *Report on Radium Therapy for 1950.* ROBERT E. FRICKE AND MARTIN VAN HERIK, Rochester, Minn. Proc. Staff Meet. Mayo Clinic. *26*:306-08, August 1, 1951.

Our supply of 2.5 Gm. of radium was in constant use during 1950. During the year, 2,497 treatments of all kinds were given in 761 courses to 676 patients. Fifty-two per cent of the 676 patients were treated for malignant disease, and 48 per cent were treated for nonmalignant conditions. Four thousand and two hundred radon seeds were used during the year; there were 242 requests for these from different sections of the Clinic.

A total of 355 malignant and 321 nonmalignant conditions were treated during the year. Statistics are of little interest, but it is interesting to know that, of the patients treated for malignant disease, 51 per cent were referred from the section of Obstetrics and Gynecology for treatment of cancer of the cervix or corpus uteri, vagina, vulva, or ovary. Nineteen per cent received treatments for rectal cancer.

During 1950, we examined 96 patients who apparently had been cured of microscopically proved cancer, and who had received radium therapy with supplementary roentgen treatment here at least five years ago. Seventy-four of the 96 patients had received no treatment for the past five years; 20 had been treated more than ten years ago, and 2, more than 20 years ago. Most of these patients, 81 of the 96, had been treated for carcinoma of the uterine cervix. The remainder had received treatment for carcinoma of the corpus uteri, vulva, ovary, urethra, rectum, thyroid gland, or penis.

Intensive work in the field of cancer therapy is being done throughout the world. Several radioisotopes which can be administered orally or parenterally yield the same rays evolved by radium and its decay products. Some are important because of beta particles emitted, and some, because of the gamma irradiation. The promising elements at present seem to be radioisotopes of gold, cobalt, strontium, iodine, and phosphorus. Some or all of them may prove of great value in cancer therapy. 2 tables. —*Author's abstract.*

30. *Carcinoma of Female Breast. Case Report with Discussion.* D. W. PENNER, Manitoba, Canada. Manitoba M. Rev. *31*:361, June-July 1951.

This is a brief general discussion of carcinoma of the female breast, using a 77 year old white female with long-standing mammary carcinoma as an example. This patient had a history of a tumor in the breast for ten years and at autopsy showed metastases to regional axillary nodes, mediastinal nodes, and both lungs. The survival rates of various types of untreated carcinoma are discussed. Treatment of operable mammary carcinoma is still considered to be radical mastectomy, with or without radiation. Delays in treatment are too often caused by the doctor. Location of the tumor, as well as its type, is of practical significance in the survival of the patient with inner quadrant tumors carrying a more serious prognosis.—*Author's abstract.*

31. *Cervical Spine Injuries.* JAMES E. WATSON, Houston, Texas. Texas State J. Med. *47*:341-44, June 1951.

Uncomplicated injuries of the cervical spine respond well and require only a few days hospitalization when conservatively treated by traction with an ordinary canvas head halter and a molded leather collar. The diagnosis is based on a history of neck injury, neck pain aggravated on movement, abnormal position of the head on the neck, tenderness at the area of injury, and roentgenologic evidence of the bone or joint defect. Thorough roentgen examination, including anteroposterior, lateral, oblique, and through-the-open-mouth views, should be made and interpreted by an expert. Sufficient neurologic examination should be done to rule out spinal cord or nerve injury.

With the patient supine on a firm bed, the canvas head halter is adjusted to the chin and occiput. A Buck's extension is attached to the spreader of the halter and 3 or 4 pounds of weight applied for an adult. Traction is in a straight line for odontoid fracture, otherwise in slight hyperextension. The weight is increased to about 10 pounds, and in a couple of days the weight is reduced to about 5 pounds. After this time the patient may be cautiously turned from side to side, keeping the neck in the same position relative to the head and trunk. After a week or 10 days a Schanz collar (made of a 6 foot length of 8 inch stockinet smoothly filled with a dozen layers of sheet wadding) may be firmly wrapped around the neck under the chin to continue

immobilization temporarily, while the patient is moved from the hospital to his home. The traction is continued at home for a total of 3 weeks. Unless the odontoid is injured, a molded leather collar is fitted and worn for about 3 months. If there was odontoid injury, the traction is followed by immobilization in a Minerva plaster jacket for another 3 weeks; then the collar is fitted. After a total of 3 months, it is likely that the repair of the neck structures is as strong as it will ever be, and cautious movements may be started, the collar gradually discarded, and the patient cautioned against sudden or extreme movement of the head for an indefinite, but prolonged, time.

An illustration case of bilateral atlantoaxial dislocation with fracture of the base of the odontoid process is reported. 8 references.—*Author's abstract.*

82. *Observations on Twenty Years of Experience in Surgery of the Sympathetic Nervous System. Division I.* PAUL C. FLOTHOW, Seattle, Wash. West. J. Surg. 59:110-16, March 1951.

The author reviews his extensive experience of over 20 years in surgery of the sympathetic nervous system. He notes the fact that in 1930 he reported his first 14 sympathectomies, 3 for Buerger's disease, 4 for arthritis, 3 for amputation stump neuralgia, 2 for Hirschsprung's disease, 1 for recurrent Tic Douloureux (Gasserian Ghost), and 1 for atypical facial neuralgia.

In retrospect, sympathectomy is well established in the treatment of Buerger's disease and other vascular lesions, even of arteriosclerotic type. It has been abandoned in cerebrel spastics, the condition for which Royle made the operation famous. It has also been abandoned in arthritis, although the author feels it is of value in selected cases. Sympathectomy is of questionable value in the treatment of amputation stump pain and phantom, Hirschsprung's disease, Gasserian Ghost, and atypical facial neuralgia. The author states that diagnostic injections for painful conditions are very undependable due to psychologic factors. He states further that he has almost entirely given up diagnostic injections in vascular lesions because a negative result is not diagnostic as frequently surgery will produce favorable results in spite of negative results from injections.

The author reaffirms his statement of 1930 that the sympathetics do carry pain afferents. He decries the use of alcohol injections stating that surgery is safer and offers less morbidity.

He recommends sympathectomy in some unusual cases such as Gastric Crisis of Tabes and Ununited fractures of long bones and relates cases to support his recommendation. Sympathectomy is recommended in any case where it becomes necessary to ligate a major blood vessel including the carotid arteries. He states that preliminary sympathectomy will prevent hemiplegia.

Stellate injections are recommended in cerebral thrombosis but not in the early stages of frank cerebral hemorrhage.

A lot of space is devoted to the treatment of hypertension. After an extensive experience utilizing all types of operation, including an extensive radical transplural resection, he has returned to his earliest operation of subdiaphragmatic splanchnic sympathectomy. He states that over the years the more radical types of operation do not give sufficiently superior results to warrant their continuance.

Based on his experience in the surgical treatment of angina pectoris, which has been most satisfactory, he notes several cases of severe associated decompensation which were markedly improved by sympathectomy.

On the basis of this observation, he has done several cases of various types of cardiac decompensation with good results. He has not sufficient cases nor has there been enough time elapsed to draw any definite conclusions, but he feels that any case that can be temporarily compensated medically can be semipermanently compensated by bilateral resection of sympathetics D-1, 2, 3, 4. He feels that the same principles may be applied to treatment of vascular insufficiency of the heart muscle that apply to vascular insufficiency of the extremities. 16 references.—*Author's abstract.*

pediatrics

83. *Diabetes Mellitus in Infants and Children.* A. L. NEWCOM, Chicago, Ill. Illinois M. J. 99:204-06, April 1951.

The prognosis of the newborn infant of the diabetic woman has been favorably influenced by the use of spinal anesthesia without analgesia, immediately aspiration of the gastric contents of the newborn infant, and delayed clamping and cutting of the umbilical cord.

The six cases of diabetes in infants were studied, and in only one was there a preadmission diagnosis of diabetes mellitus. Because the infants are often in a state of shock, diabetes is not immediately considered a possibility. The true diagnosis is suspected and established because hyperpnoea has persisted despite the disappearance of the other respiratory symptoms.

The principles of management and child diabetes are briefly outlined. No amount of time should be spared in teaching thoroughly the parent and the child regarding knowledge of diabetes, testing of urine, food principles, and technique of administration and knowledge of effects of insulin. 9 references.—*Author's abstract.*

84. *Investigation on the Care and Treatment of Poliomyelitis Patients.* ALBERT G. BOWER, V. RAY BENNET, JOHN B. DILLON AND BERNARD AXELROD, Los Angeles, Calif. Ann. West. Med. & Surg. 4:561-613, Oct. & Nov. 1950.

This report, which does not lend itself to ready summarizing, describes a research program on the development of equipment for the care and treatment of acute poliomyelitis patients with respiratory involvement. "This research produced many changes

in the equipment and technic for treatment that have proven valuable in maintaining and rehabilitating poliomyelitis patients with respiratory involvement. Much further work and evaluation remain to be done." 61 figures. 31 tables.

85. *Second Attacks of Poliomyelitis: Report of a Case with Autopsy Findings.* ARCHIBALD HOYNE AND IRVING LIPTON, Chicago, Ill. J.A.M.A. *146*:707-09, June 23, 1951.

A second attack of poliomyelitis with fatal termination and autopsy findings in a white woman aged 31 years is presented. On pathologic examination the nervous system showed typical lesions of both recent and past involvement. It is possible that second attacks of poliomyelitis are due to an immunologically different strain against which the patient has no previous immunity. 12 references. 1 table. 1 figure.

86. *Aerosol-Penicillin Therapy for Infants and Children.* P. KALBERG, G. STERNER AND G. WALLMARK, Stockholm, Sweden, Ann. Paediat. *175*:263-73, Nov. 3, 1950.

Penicillin was found to reach approximately the same concentration in the blood in 30 children one month to 2½ years of age when absorbed by aerosol as when given by parenteral injection. A dose of 50,000 I.U. seems to be the most suitable for children of this age, regardless of body weight, given 3 to 6 times a day according to the severity of the infection.

For younger children a plexiglass dome, to which an oxygen-driven spraying device is attached, provides the most suitable apparatus for conducting the treatment. Older children can use a mask. Less difficulty is encountered with a modified plastic mask described.

Since inhalation should result in a higher local concentration of the drug in the air passages, this method seems particularly suited to patients with chronic pulmonary infection with a poor blood supply to the infected areas, and also for children requiring long administration of penicillin or when needle pricking is undesirable. 13 references. 4 figures. 1 table.—*F. T. Johnson.*

87. *Role of Birth Injury and Asphyxia in Idiopathic Epilepsy.* J. M. NIELSEN AND C. B. COUREVILLE, Los Angeles, Calif. Neurology. *1*:48-52, Jan.-Feb. 1951.

There is strong evidence that idiopathic epilepsy is due to small cortical focal areas of damage in individuals with lowered convulsive thresholds.

Firstborn children, because of difficulties during birth, are twice as susceptible to epilepsy as are children subsequently born to the same mother. Nevertheless, children of subsequent birth may suffer from exactly the same difficulties at birth as do the firstborn, and consequently may also have epilepsy due to birth trauma or asphyxia. The focal lesion resulting from asphyxia or birth trauma acts as a trigger mechanism, but is not adequate to produce epilepsy in all persons. A lowered convulsive threshold, as indicated by cerebral dysrhythmia, is necessary in many instances. Estimates indicate that 40 per cent of all cases of idiopathic epilepsy are in firstborn children.

A small percentage of those subsequently born also develop epilepsy because of birth trauma. Probably more than one-half of all cases of essential epilepsy are the result of birth injury or asphyxia. The remainder are due to a variety of causes of cerebral damage.

Because there may be a cerebral focal lesion mechanism, the authors believe that each case should be evaluated from the standpoint of surgical intervention. 9 references.—*Author's abstract.*

88. *Exchange Transfusion for Fetal Erythroblastosis.* H. W. KAESSLER AND J. J. LEDGARD, Bronxville, N. Y. J. Pediat. *39*:174-79, 1951.

A method of exchange transfusion via the saphenous vein is described. This is recommended as an alternate route when the umbilical vein is not available.

The saphenous vein is exposed in the middle of the upper thigh, about one inch distal to the inguinal ligament. A 20 gauge plastic catheter is introduced into the incised vein, and passed along the femoral and iliac veins into the inferior vena cava. Blood is alternately injected and withdrawn from this site. 10 references. 4 figures.—*A. M. Bongiovanni.*

89. *Serum Protein Values in Infants Fed Soya-Bean Milk.* S. DAVID STERNBERG AND IRVING J. GREENBLATT, Brooklyn, N. Y. Ann. Allergy *9*:190-94, March-April, 1951.

Allergic reactions, such as eczema, vomiting, diarrhea, abdominal cramps or respiratory tract manifestations in artificially fed infants may necessitate removing cow's milk from the infant's diet. Vegetable milks may be substituted, and it has been claimed that these may be inadequate to support optimum nutrition and may lead to hypoproteinemia. This study was undertaken to determine the effect of serum proteins on infants fed soy milk (Mull-Soy) for the first three months of life.

Two small series of infants were intensively studied. In the first series two infants were placed on soy milk at birth and two on evaporated milk formula as controls. Blood samples were taken at two intervals in the nursery and then once each month. In a second series five infants were placed on soy milk. Blood samples were drawn once in the nursery and once at the end of three months. In addition, prescriptions for the children included orange juice and a multivitamin preparation at one month of age, cereals at two months, and vegetables at three months.

Blood proteins of the 55 infants in a preliminary study ranged from 4.2 Gm./100 cc. to 7.3 Gm./100 cc., with an average of approximately 6.3 Gm./100 cc. The total protein levels in infants on soy milk averaged 6.7 Gm./100 cc. in the nursery, with a range of 5.1 to 7.3; and 6.6 Gm./100 cc., with a range of 6.0 to 7.2 at three months. At the same time intervals, the controls averaged 6.7 and 6.1 Gm./100 cc., respectively. No hypoproteinemia developed in infants comprising the two series. Blood serum proteins did not differ significantly from those of the preliminary study, and growth and development were not disturbed. 2 figures. 2 tables.

book reviews

Patterns of Disease, FRANK L. APPERLY, M.D. Philadelphia, J. B. Lippincott Company, 1951. Price $8.00.

Most textbooks of pathology identify on morphologic grounds the diseases affecting tissues removed at operation or autopsy. They offer a means of working backwards to elucidate the beginnings of disease. Nevertheless, such texts omit two major phenomena. First, presentation of the disease process from the beginning and tracing its progression step by step. And, second, the compensatory mechanism adopted by the body. Without an understanding of these two principles anatomy and pathology have no significance. The author proceeds on this basis, evaluating each system in terms of physiologic pathology. The first chapters evaluate passive changes in disease i.e., those biochemical manifestations that are responsible for altered function and varied symptomatology. Then, there are discussions of reaction changes to infection indicating the ability of the body to compensate for the underactivity of its diseased organs. Indeed, these underactivities of the relatively unaffected tissues or organs unravel the symptoms of symptomatology. The author then proceeds to evaluate the underlying basis of dysfunction in the various systems of the body. Each of these discussions is a scientific approach to mechanism in health and in disease. There is a pertinent reference to the initiation of physiologic and pathologic changes by psychic phenomena. The book is a stimulating revelation of disease in the making.—*I. Newton Kugelmass, M.D.*

Physical Chemistry, WALTER J. MOORE. New York, Prentice-Hall, Inc., 1950. Price $7.90.

The difficulty in elementary physical chemistry lies not in the mathematics itself, but in the application of simple mathematics to complex physical situations. This statement is apt to be small comfort to the beginner, who finds in physical chemistry his first experience with such applied mathematics. The familiar x's and y's of the calculus course are replaced by a bewildering array of electrons, energy levels, and probability functions. By the time these ingredients are mixed well with a few integration signs, it is not difficult to become convinced that one is dealing with an extremely abstruse subject. Yet the alternative is to avoid the integration signs and to present a series of final "equations" with little indication of their origins, and such a procedure is likely to make physical chemistry not only abstruse but also permanently mysterious. The derivations are important because the essence of the subject is not in the answers we have today, but in the procedures that must be followed to obtain these and tomorrow's answers. The student should try not only to remember facts but also to learn methods.

The author discusses the following aspects of physical chemistry brilliantly:

The description of physiochemical systems; the first law of thermodynamics; the second law of thermodynamics; thermodynamics and chemical equilibrium; changes

of state; solutions and phase equilibria; the kinetic theory; the structure of the atom; nuclear chemistry and physics; particles and waves; the structure of molecules; chemical statics; crystals; liquids; electrochemistry; surface chemistry; and chemical kinetics.—*I. Newton Kugelmass, M.D.*

The New Way to Better Hearing, Through Hearing Reeducation, VICTOR L. BROWD, M.D. New York, Crown Publishers, Inc., 1951. Price $3.00.

Hearing involves the reaction of the body to that narrow band of frequencies of air-vibrations that we call sonic. For all practical purposes, the body is opaque to these vibrations except for two tiny organs no larger than peas. Stimulation of the cochleae gives one the sense of an overall experience. This capacity of the ear to assume the sensation of sound for the whole body is in a sense equivalent to the stimulation of the entire body. When the integrity of hearing has been reduced, there are many ways to compensate for the loss. This popular message is directed at various interested groups. First, to the person with impaired hearing; second, to the parents and relatives of such a person; third, to teachers, social workers and special therapists. It is a system of hearing reeducation with specific instruction on how to improve sense acuity for sound.—*I. Newton Kugelmass, M.D.*

Physical Fitness of Champion Athletes, THOMAS KIRK CURETON, JR. Urbana, University of Illinois Press, 1951.

The physiology of physical exercise is a unique contribution to metabolism. It is a study of the magnificient machinery by which the body, mind, and spirit produce marvelous feats of neuromuscular, cardiovascular, and respiratory performance. There is a wide range of physical activity revealed by these tests performed on athletes during feats of endurance. Careful studies have been made of the physique, body type and anatomic proportions. Measurements were made of motor fitness. Metabolic data was determined in the course of various athletic performances. Nevertheless, the relative influence of training and willingness to endure as compared to the inherited form and structure of the body in determining success in athletic competition is not fully delineated by these results. Neither does the study answer what may be the comparative course of health of athletes as compared to nonathletes. The author's plan is to continue these studies in and out of condition in the hope of unraveling the underlying forces behind physical development and individual vitality. This monagraph represents a creditable undertaking in unraveling the merits of physical fitness.—*I. Newton Kugelmass, M.D.*

Understanding Your Son's Adolescence, J. ROSWELL GALLAGHER, M.D. Little, Brown & Company, 1951.

The author is a school physician, in charge of an adolescent medical service. He deals with boys who come to him with questions about their physical and mental health and problems concerning their activities. Consequently, the purpose of this

book is to answer some of these questions about health, habits, growth, school failures, growth periods and behavior problems. The book is refreshing in its attempt to develop points of view on adolescents. The author treats the adolescent as a personality, and not as a problem. He points a way towards understanding him in terms of what he is, rather than what he actually does. Once the adolescent boy is unravelled, the feeling of anxiety about the problem will be overcome and a wholesome solution formulated. Each adolescent is treated as an individual, different from all others. His needs are exactly the same as everyone's else but he satisfies these needs in his own particular manner. Fortunately, deep-seated changes continue before final maturation. That accounts for the trial and error behavior of the adolescent in his final adaptation. The author unravels everything from the adolescent's standpoint, how he tries to grow up; how he tries to be healthy; how he adjusts to the inner sex urges and how he seeks ways out of his misbehavior. The author indicates ways of developing mental health as the basis for sound maturity.

Biological Antagonism, The Theory of Biological Relativity, GUSTAV J. MARTIN, SC.D. Philadelphia, Blakiston Company, 1951.

The author reviews biological antagonism as reflected in natural and synthetic displacing agents, covers antagonism as seen in the fields of amino acids, purines, pyrimidines, vitamins, hormones, minerals and as it forms the basis of immunology, pharmacology, and chemotherapy. Finally, he offers the concept of biologic relativity based upon extensive study of these biologic antagonisms.

At rare intervals, come concepts which are intriguing to the scientific mind into the systems of biologic research. These concepts are frequently of such simplicity as to cause wonder at their delayed arrival. Then, on closer examination, it is seen that a period of growth extending over many years led to the ultimate fully formed structure. Such a concept is the one of structural displacement, which rightly has been called "The Rational Approach to Chemotherapy."

To the immunologist goes credit for the first recognition of the value of the theory. Ehrlich applied it in his famed "Lock and Key" analogy. A more rewarding and stimulating approach to immunology has not been suggested before his time nor has one been recorded since. An entire world—the world of the antigen and antibody—grew up around this "Lock and Key" approach.

Enzyme chemists soon took up the new concept and developed it into a fundamental structure. To the embarrassment of the biochemist and pharmacologist alike, it must be admitted that research in these fields failed to recognize the merits of metabolite analogue approach until much later. The renaissance of the concept came with the work of Woods in England in 1940. Its popularity grew until 1947 when many early enthusiasts began to abandon the cause. The concept remains a storehouse of potential chemotherapeutic and pharmacologic agents. The purpose motivating the preparation of this summary of knowledge in the field of displacement is a belief that in no single instance of specific displacement has a thorough job been done, and that such work, properly undertaken, will lead to discoveries of

chemotherapeutic agents of great value in medical science. The author feels that a reference work on the subject will facilitate the entry of others into the field and thus aid in causing the concept to be formed into a scientific structure of great practicality.—*I. Newton Kugelmass, M.D.*

Liver Injury, Transactions of the Ninth Conference April 27 and 28, 1950, New York, N.Y., edited by F. W. HOFFBAUER, M.D., sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y., 1951.

This monograph is a sequel to previous round-table discussions on liver dysfunction. Popper correlates hepatic function with structure on the basis of liver biopsy studies. Schiff presents clinical approaches of needle biopsy of the liver. Bradley presents the clinical aspects of hepatic vascular physiology. Bollman elucidates the role of hepatic lymphatics in health and disease. Hartroft gives experimental studies of dietary cirrhosis and Davies unravels the tropical disease, Kwashiorkor.—*I. Newton Kugelmass, M.D.*

Acta Medica Scandinavica Supplementum 261, *Renal Regulation of the Extracellular Fluid II, Renal Physiology in Electrolyte Subtraction*. D. A. DENTON, VICTOR WYNN, I. R. MC DONALD and SHIRLEY SIMON, Melbourne, Australia, 1951.

This monograph deals with renal physiology when electrolytes are extracted from the extracellular fluid. The difference in renal behavior in these two phases of subtraction stress is due to the fact that in the latter case the body is able to produce a biologically inactive anion-bicarbonate—whereas in the former case no analogous mechanism has evolved for the production of a biologically inactive cation for use within the extracellular fluid. Clearly, the homeostatic mechanisms of electrolyte conservation are more effective in excess Cl — substraction than in excess Na + substraction. The mechanisms controlling ionic pattern represent a very fundamental feature of tubular behavior in that they appear to operate independently of the fact that the plasma levels may be reduced much below the so-called "renal thresholds" of these ions, and independently of any simultaneous stress on osmo-regulation. A large part of the experimental material which is reported centers around the most striking example of excess Na + substraction from the body—viz., the post gastrectomy type of duodenal fistula.

The question arises, "What specific stimulus causes the renal tubules to react to the substraction of Na + in excess of Cl — from the extracellular fluid?" Investigations to date suggest that there is a functional integration of renal tubular mechanisms, so that they actually operate relative to electrolyte relationships. Hence reabsorption is dependent on the electrolyte pattern of the glomerular filtrate rather than upon each individual renal tubular reabsorptive mechanism operating to maintain a constant concentration of a single electrolyte. Thus, adequate description of renal behavior towards electrolytes can be made only in terms of the electrolyte pattern relative to which the renal tubules work.

It would seem that it is necessary to develop a relativistic terminology in this branch of physiology. From this viewpoint, propositions such as the "renal threshold for Cl—" represent the abstraction and consideration in isolation of one component of a system when the mechanisms which control it operate relative to an electrolyte pattern. Propositions which involve absolute concepts of this type are, in this context, in the category of the meaningless question, and it is suggested that the term "threshold" be abandoned in renal physiology.—*I. Newton Kugelmass, M.D.*

news

DR. MANN NAMED DIRECTOR GENERAL OF HADASSAH MEDICAL ORGANIZATION IN ISRAEL

Dr. Kalman J. Mann, of Jerusalem has just been appointed Director General of the Hadassah Medical Organization (HMO) in Israel. Dr. Mann, who has been in the United States for the past few weeks, took the occasion to make the first public announcement of a radically new community health program, which Hadassah will inaugurate in Israel and which will involve drastic revision in the training of Israel's physicians.

Hadassah conducts a health and medical program in Israel, which includes operation of a network of seven hospitals; joint operation of the Hebrew University Hadassah Medical School, the only one in Israel; 72 health welfare stations; a comprehensive health center in Jerusalem and a countrywide system of child hygiene. Hadassah is currently raising $5,500,000 for a new medical center in Jerusalem which will include a 430-bed university teaching hospital, a nurses training school. In addition funds are being raised for new buildings for the medical school.

The training of new physicians in Israel, Dr. Mann said, will stress the social medicine orientation. The curriculum of the Hadassah Medical School will be so revised, he said, that the medical student will first have to "study community health problems before he is even admitted to the diagnostic and curative phases of his training. The focal point for this part of his education will be the community health centers which Hadassah maintains in the Jerusalem-Tel Aviv corridor."

Emphasis will be on maintenance of health rather than on diagnosis and cure of disease. This will involve among other things such activities as control of the sources of infection and means of its transfer in a community, immunization of its inhabitants, a comprehensive system of health education and other phases of public health."

Dr. Mann said that the new program "was particularly suited to Israel where enforced austerity could conceivably jeopardize health standards. Preventive medicine can play an important part in forestalling this. Also the community health approach helps preserve life at a comparatively low cost, an important consideration in a nation struggling with its economy. A third factor is that a goodly portion of Israel's immigration is from countries where public and community health was utterly unknown. They will now be introduced to it."

antibacterial barrage

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